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A university of liberal and technical learning founded by William Marsh Rice in the City of Houston, Texas, and dedicated by him to the advancement of Letters, Science, and Art

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THE RICE MEMORIAL CHAPEL*

THIS is a very significant day in the history of the Rice Institute. We are deeply grateful for the generosity of Mr. and Mrs. J. Newton Rayzor, who have brought to realization the hope of many years that Rice should have a chapel as a center of our religious interests and activities. Now that we have met here to dedicate our Chapel, it is important for us to consider what we are dedicating and the purpose to which we are dedicating it. Why should Rice have a chapel at all: why should religion have a recognized place in the life and program of our university, and what is this place and role of religion? I am not talking to you here on the spur of the moment. Day after day, as I have watched this beautiful building rise on our campus, I have been thinking about it, and now I give you simply my candid personal opinion.

Henry Thoreau said that in every temple there should be a statue to the Goddess of Sincerity. And I feel that sincerity is our chief duty on this occasion. Shall I spend this half hour in reciting soft words about God and religious faith? God is in no need of compliments from me. But you and I do have a need, the need of recognizing clearly and candidly the critical state of thought to which modern education has brought many minds in their views about religion. What is the reason for this tension between higher education and religious faith? This is a very serious problem in our spiritual life; we cannot brush it aside. It is imposed on our reflection at this hour of dedicating our university chapel. In

* An address delivered at the Dedication of the Chapel on February 8, 1959.

a forthright spirit we should inquire what it is that the university and the church, critical thinking and religious conviction, have to say to each other. A better mutual understanding of these two is important, for the church needs the cooperation of thinking minds, and surely thinking men need the highest values of life which are to be found in religious experience.

Let us consider briefly the part which religion and theology have played in the historical development of universities in our Western civilization.

The medieval schools and universities were established and directed by the church. The center and summit of their educational programs were theological. Their doctors were doctors of the church, and the greatest of them were canonized saints, like St. Bonaventura, the Seraphic Doctor, or the most eminent, St. Thomas Aquinas, the Angelic Doctor. This concentration on religion and theology which marked medieval Catholic education persisted for some time also under Protestant authority. At Calvin's University of Geneva a student had to inscribe himself a Calvinist before he could be admitted to the lectures. And at Harvard in its early days the President and Faculty admonished the student to "consider well the main end of his life and studies, . . . to know God and Jesus Christ, which is eternal life."

This educational dominance of theology is not altogether extinct in our time. It still survives in some sectarian institutions. But the whole spirit of the great modern universities proceeds in a different direction. I do not know of any seraphic or angelic doctors in our college faculties. Our programs of higher education are explicitly ordered under the heads of the sciences and the humanities. This radical shift of emphasis has marked the intellectual history of our Western world since the Renaissance. Both the content and the

criteria of modern thinking have differed radically from those of medieval minds. Instead of meditating on theology and supernaturalism, men turned to the investigation of nature and human nature. The modern mind became secular in its range of interests. And it has been secular also in its methods and in its tests of knowledge. Men no longer submitted to dogmatic authority but undertook to find the facts by direct inquiry, to organize their ideas by logical methods, and to submit them continually to experimental control and rational criticism. The Scholastics adopted as their first principles the dogmas of the church, and then by analysis and deduction reasoned out an orthodox system of conclusions. But modern minds, scientific and humanistic, have sought by the study of the facts undogmatic knowledge of the world about us and of ourselves in this world. Modern thinking has gained in mastery by adopting specialized methods of inquiry in the various sciences. The secular mind has matched theoretical mastery with practical skill: so the pure and the applied sciences have expanded beyond belief both our knowledge of the laws of nature and our use of its vast resources.

What I have recited here are the plain historical facts; but what interests us in our problem is to consider the bearing of these facts on religion. The medieval doctors of the church did have a place for science and philosophy. They called them servants of theology. The Scholastic teachers meant to say that science and philosophy should serve and submit to final theological authority. This sort of subservience the modern mind has rejected conclusively. But there *is* a great service which modern science and critical history and philosophy have indeed rendered to religion. They have exposed the untenable character of many traditional religious beliefs, and so they have compelled some religious minds to reconsider their basic principles and the true character of religion.

It is very important that we should be clear about this great service of modern criticism to religion. Any intelligent and fair-minded student of the history of ideas knows that the progress of truth in every field has been marked by the continual exposure of traditional errors. The history of science is a record of this progressive self-revision and self-correction. All the religions of the past, including the Christian, have expressed in many ways the thinking of men whose knowledge of nature and of history was defective. And there is nothing discreditable in men's early beliefs in untenable ideas. What is lamentable is many men's continued advocacy of errors after they have been proved to be wrong and untenable.

To recognize without any evasion these exposures of errors in our religious traditions is essential, if religion is to retain, or better, to regain the confidence of enlightened thinking minds. Let us remember that the Chapel which we are dedicating today is a university chapel. If it is to serve the spiritual needs of our Rice community, faculty and students alike, it must express a spirit in religion which does not ignore the problems of critical thinking. You cannot brush aside here the exposure of superstitions, lest some young minds reach the disastrous conclusion that religion is nothing but sham and superstition—and that would be spiritual ruin. A general charge of erroneous beliefs may sound offensive, yet even a brief statement of some modern facts and conclusions should suffice to convince us that the main criticism is sound. The plain fact is that in one field of inquiry after another, whenever modern minds have investigated nature or explored history with pure respect for the truth, they have been led to conclusions contrary to many established religious beliefs. Against the parochial doctrine of an earth-centered universe is the boundless universe disclosed by the telescopes of mod-

ern astronomy, of innumerable stars and solar systems, in which our earth is but a speck within a speck. The time outlook of church tradition was just as meager as its spatial range. The old Biblical scholarship of Archbishop Ussher dated the creation of the world at 4004 B.C. But historical research has recorded established civilizations of greater antiquity, and the Archbishop's 4004 years would have to be multiplied not a thousand but who knows how many million times before they could reach the origin of the universe: that is, if there could be any sense at all in the idea of the origin of the universe. Modern biological research has discredited the old Hebrew tales about the creation of plants, animals, and man and woman. Modern literary-historical studies of both the Old and the New Testament writings have shown the need of thoroughgoing revision of our traditional views about the Bible. Every one of these statements can be elaborated and documented. But again we ask: What bearing do these conclusions of modern scientific and historical research have on our understanding and evaluation of religion?

In trying to answer this question we require a spirit of integrity in our devotion to the truth, wherever the truth may point. This spiritual integrity is itself a condition of our realization of the highest values, including the values of a mature religion. The single-minded pursuit and possession of the truth, as it emancipates us from the bonds of errors and superstitions, where religion has been weak and unsound, should enable us to recognize the real spiritual foundations of religion, where it has been and still is strong and true and abiding. This is the mark of spiritual integrity and spiritual growth. St. Paul expressed it truly: "When I was a child, I spoke as a child, I thought as a child, I reasoned as a child; when I became a man, I gave up childish ways."

This, then, first of all: seek the truth and hold fast to the

truth. The words of St. John inscribed on the Main Building of the University of Texas should be the motto of every educator: "Ye shall know the truth, and the truth shall make you free." And they should be the motto of our religious quest, for as the great Jewish philosopher Spinoza put it in a word, "God *is* Truth." Twelve and a half centuries before Spinoza, St. Augustine expressed it even more eloquently: "Let every good and true Christian understand that truth, wherever he finds it, belongs to his Lord." To which we may add that any error anywhere cannot be of the Lord and must be abandoned by good religion. We cannot establish sound religion upon unsound and mistaken ideas. It is misdirected piety to claim Divine authority for our continued beliefs in fallacies. The words of Job to his bigoted friends should be a warning to us all: "Will you speak falsely for God, and speak deceitfully for him? . . . Can you deceive him as one deceives a man?" Galileo was right in his answer to the Inquisition when he was accused of teaching doctrines contrary to God's truth. He said that the only way he had of being sure that his ideas were not contrary to God's truth was to make them as true as possible. "Ye shall know the truth, and the truth shall make you free."

But at this point the religious traditionalist may raise an objection: Are there not errors also in your sciences, in your histories, and in your philosophies? This is certainly the case, and good science and good philosophy must be the first to acknowledge and abandon errors as soon as they are exposed. The astronomy of Aristotle and Ptolemy is like the biology of the Book of Genesis: erroneous. A good Aristotelian should not waste his time in defending Aristotle's errors, but now, should he dismiss also the great truths in the Aristotelian philosophy? By no means: we reject errors, but we remain loyal to the truths. Even so in our use of the Bible

and in our understanding and evaluation of religion. Again St. Paul teaches us here: "Prove all things, hold fast to what is true."

Right here we may see the crucial confusion in which the very advance of the modern sciences has embroiled many minds. It is the confusion of thinking that science has not only exposed certain errors in traditional religion but has not replaced religion altogether, that physical science provides the one and only account of reality and human life. This proposal to use physical science as an all-comprehending philosophy of life is as mistaken in its way as the traditional proposal of theology to dictate the course and conclusions of scientific research. It is the replacement of one dogmatism by another. There is more to the world and to man than the mechanism which the physical scientist is so competent in exploring and exploiting. For there is man's spiritual activity, his creative genius in all the arts, his pursuit and achievement of moral values, his self-dedication to standards and ideals. Let us keep in mind the great words of the ancient philosopher Plotinus engraved on one of the tablets of our Lovett Hall: "Love, beauty, joy, and worship are forever building, unbuilding, and rebuilding in every man's soul."

The scientific activity itself disproves any exclusively mechanistic doctrine. Physical science deals with physical things and processes, but science itself is not a physical process; it is an intellectual, logical activity. The truths of quantum mechanics do not imply that the quantum theory itself is merely a quantum process. Scientific thought is an outstanding evidence of the reality of rational power in the world. Even more: there is scarcely any class in our society which exemplifies more truly the spirit of integrity in the pursuit of truth than the class of pure scientists. So when some of them venture to express their philosophy of life, they

should not—shall I put it in this way?—they should not forget themselves and speak as if what their telescopes and microscopes and radiation screens disclose is more real than their minds which devise and interpret it all.

Surely you can recognize in what I have been saying our deep personal quandary, the perplexity in which so many of us find ourselves in our deepest thought and feeling. On the one hand, much of our structure of religious beliefs has been disrupted by modern research, and we are disturbed about the rest of it. Nor can we wish it otherwise, for after all, truth is truth and error is error. Precisely in religion, our most important concern, it is imperative that we face reality as it is. We should remember the warning of the poet Arthur Clough:

> But play no tricks upon thyself, O man;
> Let fact be fact, and life the thing it can.

This is one side of our problem, and regarding it I see no way of evasion. But there is another side. The scientific and humanistic accounts of our world and ourselves in it, correctly described and explained though they are in so many ways, yet impress us in final judgment as insufficient. Something is lacking in them all, and that the most important. We have reliable knowledge of so many matters, but the great saving word of wisdom which we need above all—how and where are we to find it? Is not this the spiritual problem of our age, so learned in its various ways, and yet so perplexed and dismayed in the very heart of its needs and hopes?

Here, then, as I see it, is the true place of this Chapel in the life and thought of our university. Alongside of the classrooms, libraries, and laboratories of secular scholarship and research, this Chapel should provide the living expression of men's agelong quest of the center and summit of spiritual values. My little talk today is not a sermon, but it does have a text. My text is in the words addressed by St. Paul to the

Athenians: all people "seek God, in the hope that they might feel after him and find him. Yet he is not far from each one of us." Men's religious search for the divine realities is universal. No age, no special tradition has the exclusive possession of the truth or of spiritual insight. Our Chapel at Rice should not be a sectarian institution of any sort. No special creed, no rigid ritual, no isolation should have any place here. In this Chapel every seeker after the Divine should feel at home.

As we sit together here, note some interesting aspects of what is around us. This Chapel on our Rice Campus is next door to our rooms of social contacts and friendships. Religion is not apart from life; it is not alien to our plain human interests. Warp and woof, true religion is of the texture of daily human living. Was not this characteristic of the Protestant Reformation, that it sought to span the traditional gulf between laymen and clergy, between secularism and spirituality? This is life-pervading religion, in which men and women work, play, plan, build, study, trade, and in all their various walks of life, in joy and in sorrow, minister to each other in love and good faith. So the religious values are not above or apart from actual human life. As Jesus put it, "the Kingdom of God is within you."

Thus religion is bound to engage, not only our feelings and our practice, but also the principles and problems of our thought, our critical intelligence. It is also bound to affect and refine our taste. Across the road from our Chapel, in one direction, is the Fondren Library, treasure-house of the knowledge and the thought of men through the ages; in another direction are laboratories of science, workrooms of ever ongoing research and discovery of new knowledge. Beside them are halls devoted to humanistic studies, to history, literature, philosophy, and to the expression and enjoyment of

the arts. We should keep in mind this correlation of our various higher interests: social, intellectual, artistic, religious. We may go our various ways in our daily concerns and specialties. But again and again our spirits are quickened, they come alive to the conviction of a supreme all-pervading spiritual reality which gives meaning and value to our lives, in which we really "live and move and have our being." It baffles all our endeavors to reduce this conviction to any definite formula. Its truth is as the truth of the greatest poetry. Wordsworth spoke for us all as he looked on Tintern Abbey:

> . . . And I have felt
> A presence that disturbs me with joy
> Of elevated thoughts; a sense sublime
> Of something far more deeply interfused,
> Whose dwelling is the light of setting suns,
> And the round ocean and the living air,
> And the blue sky, and in the mind of man:
> A motion and a spirit, that impels
> All thinking things, all objects of all thought,
> And rolls through all things. . . .

Nothing is a surer index of a man's spiritual stature than his conception of the Divine. The idea of God has been men's expression of the supreme, their gesture towards the boundless utmost of perfection. Our strength may fail: face to face with nature we may seem less than nothing. Our survey of the immense universe may show us to be insignificant specks, and our careers but ripples of a moment on the ocean of eternity. For science has disclosed to us a world in which natural forces operate without any apparent gleam of intelligence. Against this impassive universe, what are we and our hopes and ideals? The evils that beset and destroy us may not even be due to any malignity anywhere. Nature is neutral; it goes on its way unmoved.

But matter and bulk, we protest, cannot exhaust nature.

For we are in and of nature, and no account of us in terms of mere matter and bulk can comprehend us. If the universe may in one perspective be conceived as astronomer and atom-crusher conceive it, in another perspective it is revealed in our spiritual experience. Else how could we understand and explain scientific experience itself, with its logic and its problems, or conscience, or piety, the tragedy of man's religious perplexities? So our searching and aspiring spirit need not be cast down. This conviction that spiritual values are real and abiding is the heart of religious faith.

I find something profoundly significant in the circular approach to this raised round pillar, without any exclusive symbolism of any sort. This need not signify a nondescript togetherness of loose ideas, without any characteristic expression of religious convictions. Not at all. Every man's religious quest is bound to be in some ways unique, but it can also share its character of integrity and devotion with those of different beliefs and ideals. Each one of us is moving toward the Divine center along his own particular radius, whether it be Baptist or Episcopalian or Unitarian or Humanist or whatever, Protestant or Catholic, Christian or Jewish or Mohammedan or Buddhist. Along the periphery, on the outer circumference of sectarian adherence, our differences from each other are more conspicuous. But as we move towards the center, we may draw nearer and come to some closer understanding. Most of us who will come here for meditation and worship are and will be children of our Christian heritage, and to us the Christian gospel has an intimate appeal which no other religion can provide. But we can deepen our Christian insight and our devotion to the Christian truths as we come to understand the truths and the principles of other religions. Remember the words of our Lord: "In my Father's house are many rooms." We need

wider spiritual contacts. Read the Scriptures of other faiths, and then return to the Sermon on the Mount, and you will gain an intensified realization of the Christian heart of religious insight. The supreme truths carry their own conviction. What is important in the religious life is not dogmatic rigid authority but spiritual vitality. This was the heart of Jesus's appeal of a living and growing Gospel: "My Father is working still, and I work."

May this spirit of sympathetic understanding of our common spiritual quest and pursuit of the truth, may it mark this Chapel, so that it may become not a divisive but an integrating agency in our religious life, not an institution of sectarian propaganda but of tolerance and willingness to learn from each other, this spirit which is such a crucial need of us all in these days of world-wide misunderstandings and conflicts!

For religion is not only a quest; it is also a conviction: religion is our conviction of the supreme reality of the highest values. To the growing realization of these highest divine values may this Rice Chapel be ever dedicated!

RADOSLAV A. TSANOFF

PROPERTY AND PERSONALITY*

IN HIS *Voyage of the Beagle* Darwin recorded his impressions of Tierra del Fuego and its natives. There he found a communistic society, untroubled by conceptions of private property. A piece of cloth given as a present was promptly torn into strips and distributed; there was no hoarding; this was the most primitive society in the great naturalist's experience. As there was no property, there was no theft—a conclusive proof that civilisation had not even begun. We may parallel this with stages in the evolution of a human being. The infant, tired of a toy, cheerfully throws it out of his perambulator; a few years later, when he stores his toys in a cupboard, and dutifully inserts coins in his money box, his parents conclude that he is growing up. The boy's possessions are contributing to this process; from the sense of ownness, or individuality. Then, when the boy receives monetary presents, he will be likely to keep them in separate pockets, intending to devote each to a distinct purpose; he would be confused if told to pool all his assets, and make his payments from the total fund. With human beings as with nations, the balance sheet is evidence of a very advanced stage of development, for the primitive mind tends to relate each item of income to a separate expenditure, and these items would appear to be lost if they were added up. Property provides, as it were, a modulus by which we can assess the evolution of the individual and the civilisation to which he belongs.

This linking of property with evolution is very ancient. It inspired a notable contrast in ancient Greece, when Aristotle defended the institution of private property as an aid to the

* The Phi Beta Kappa address delivered before Beta of Texas Chapter on April 6, 1960.

moral development of his citizen, since it provides opportunities for exercising the qualities of liberality and restraint; while to Plato it appeared that virtue could be fostered only in an idealist state where everything was held in common. The world is still divided between these opposing views. But I am not concerned with this controversy. I am limiting my enquiry to one country, England, and almost entirely to the period between the Revolution of 1688 and the Reform Bill of 1832, a period in which freehold property provided both the basis of public life and the criterion of personal status; only gradually, and since the eighteenth century, has status ceased to be entirely dependent on property. Conclusions similar to those which I am going to suggest might be derived from other countries and other periods, notably from the colonial period in American history, in which I am inclined to think that the advance from property to status was more rapid than in contemporary England.

First of all, the word property. We generally derive it from the Latin *proprium,* one's own, something to which one has a right. From the start, the material object of possession is connected with an abstract right. The simplest example of this is the adjective *proper,* here we have detached the rightness from the possession; a less obvious example is the word *propriety,* now used exclusively to mean rightness of conduct. Formerly the word had nothing to do with conduct, but meant a right—the right to one's property. This is the earliest right to be protected by law. Then the word person. It is derived from the Latin *persona,* a mask worn by actors on the stage, as in the old Latin comedy, and was intended to designate the actors, the *dramatis personae* of the play. Whereas, in our modern drama, we tend to show the development of personality from the impact on it of circumstance, in the older drama personality is hardly distinguish-

able from character; it is static, and is usually drawn on simpler and more rigid lines. Next, the word personality. This has a long, complicated history, and it cannot be said that even the great Oxford Dictionary has been able to elucidate it. At times, it appears to be interchangeable with personalty, that is, property over which one has power of personal disposition, in contrast with real property over which, for long, one's power of disposition was limited. At other times, the word appears to mean little more than humanity, in distinction from the animal creation on the one hand and the divine essence on the other. But, and here I call the Oxford Dictionary to witness, the use of the word personality in our modern sense, that is, the consensus of distinctive, subjective qualities which distinguish each of us from everyone else, this usage does not appear until the early decades of the nineteenth century, that is, at the close of the period with which I am concerned.

In the past, character and disposition were thought of, not subjectively, but as linked with material things, such as the four humours and their proportion in the body; our complexion, in the broad sense of temperament, was something built in, as it were, to be altered only within a limited range. Characteristically, new habits, such as smoking, were considered according as they might alter this chemical balance which makes us what we are; naturally, there was disagreement on this score, some experts holding that smoking, especially when alternated with psalm singing, was a cure for melancholy, a view countered by no less a person than King James I, who argued that the contrary is true, because the smoke ascends to the brain, where it distils into liquids, thus increasing the watery content of the body, and so disposing to melancholy. In passing, it may be noted that the modern science of Biochemistry has restored interest in this old doc-

trine of humours, by revealing the function of the glandular secretions; and we now know that strong emotions, such as fear and hate, are accompanied by chemical reactions. For our purposes, the interest of the old doctrine of humours is that, as so often, matters which we regard as subjective were closely related to purely objective things. But, even more interesting than these changes of connotation, is a curious gap—the absence of our word status, in its ordinary, non-medical meaning, until about 1790, when, according to the Oxford Dictionary, it was used by Boswell in referring to the status of the negro slave. Even as late as the early decades of the nineteenth century the word was considered unusual when applied to the place held by an individual among his fellow men. Moreover, the word status was unknown to the old common law. After the Dissolution of the Monasteries by Henry VIII, a statute gave to the ejected monks and nuns the right to sue and to be sued, the only approach that I can find, in our Ancient Regime, to our modern conception of status.

Now, a gap of such dimensions raises a number of important questions. What filled it? Did the church and the canon law, by their emphasis on Christian duty and the transistoriness of human life provide an other-worldly conception of status? I think that this is possible; certainly the church modified the old materialist and semi-pagan conception of crime by introducing the element of moral guilt. But I am inclined to think that the greater part of the gap was filled by property, particularly landed property, and by the rights, usually exclusive and personal, which derived from property. As contrasted with Roman Law, the feudal law of western Europe was distinguished by a clear contrast between realty and personalty, of which the former was much the more important, because it provided the basis of the state. Land had

a pre-eminence not accorded to personal property; it was the source of food and the unit for the provision of armed defenders. True, there were merchants and towns and accumulated treasure, but these were still only on the margin of feudal society, and existed, as it were, on sufferance. But at this point another distinction must be made. In medieval England there were no landowners, in our sense of the word, except possibly the king; the members of what we call the landed classes were really tenants of an overlord, holding ultimately of the king. Most of them held by knight service having to provide a number of fully-armed knights in proportion to the extent of their holding; and in this way, feudal society was a hierarchy, each unit bound to the other by duties and rights; personal obligation was inseparably tied to landed possession or occupation. Service, not ownership, was at its basis; its motto might have been: 'In this service is perfect freedom.'

In this delicately-poised structure, where everyone had a clearly defined place, and therefore some kind of status, things did not get busy until the tenant died. Thereupon the king or overlord stepped in. Was the widow marriageable? If so, a suitable marriage could be arranged for a normal fee, and an unsuitable one for an abnormal fee. Was the heir under age? Then a guardian would have to be appointed for his custody and for the management of his lands, with annual fees for that. Both widow and heir were regarded, not as persons, but almost as articles of property, which might be sold or bartered for profit; a courtier might solicit the king for profitable widows and wards, as if they were mineral rights to be exploited. The system worked only if the king or suzerain had some gentlemanly instincts; he might be a villain, but usually he was a straightforward, outdoors villain. It was king John, the first indoor villain among English kings,

who upset the system by abusing his rights over the defenceless wards and widows; and it was in this roundabout way that Magna Carta came to be the foundation of our liberties in England and the United States.

As early as the Hundred Years War the military element in this system had become obsolete, as kings hired mercenaries; but lands continued to be held by knight service. So far from abolishing the system, Henry VIII capitalised it, by erecting the Court of Wards which imposed a system of personal surveillance and monetary exactions falling on the large class which still held of the crown. Then, in the seventeenth century, with the forfeitures entailed by the Civil Wars, many Puritans obtained large blocks of land cheaply, and meanwhile the Court of Wards had fallen into desuetude. It was abolished by statute in 1660, together with all the chivalrous tenures of the crown. In effect, therefore, tenants had now become owners; they had emancipated themselves, without cost, from both the old burden of military service, with the personal disabilities falling on their widows and children, and from the more recent exactions imposed by Henry VIII's Court of Wards. Here is the beginning of the modern English freeholder, of the landed class as we know it today. Copyhold tenure, the descendant of the old villeinage, was left untouched, and survived until 1925, when it was converted into freehold. At the threshold of our period, therefore, the freeholder and copyholder were the standard, accredited units on the land; by contrast, the landless man, the wage labourer, the cottager, the openfielder, as they had no land, had no status. They could be exploited or evicted. By the end of the seventeenth century, when the population of England was just over five millions, the landless, rightless element numbered nearly three millions. A century later, when the population had doubled, there was more pressure

on the privileged centre from the increasingly large outer ring of the unenfranchised—the unskilled workers, the paid labourers, the cottagers, the ordinary soldiers and sailors, the unemployed, a vast part of the population, conveniently described as the "poor."

This privileged minority, the landed freeholders, represented what we might call a hangover from the gradual dissolution of the feudal structure. Their counterparts were to be found in the incorporated towns, where there had long existed a privileged class of artisans who, after seven years servitude as apprentices, acquired the "freedom" of their craft or borough—a freedom which meant that they could have the law on any unqualified intruder who tried to set up shop in their midst. As on the land, freedom was associated with emancipation—in the one case, from the service of tenure, in the other case from the service of apprenticeship; and emancipation brought with it freedom in the sense of privilege or monopoly. So too in the learned professions. The church, the law and medicine were composed of practitioners who, having fulfilled the requirements for qualification, enjoyed a status to which definite privileges were attached. Accordingly, after about 1660, English society was grouped round a hard core, consisting of king and peerage, landed freeholders, copyholders and leaseholders, authenticated members of the learned professions, workers who had acquired the freedom of their craft, all of them deriving status from property, or from exclusive rights associated with property. All of these may be regarded as full citizens. They monopolised the franchise; from them were recruited the politicians and statesmen; they served on juries; if they were Anglicans, they might hold public office; they were exempt from compulsory military or naval service. They were not necessarily the wealthiest elements in the community, as

some merchants were much better off than landowners; the distinction between them was much more ancient and subtle than any economic difference. The landed freeholder was not class-conscious, for the reason that his was the only class. Nor was he merely selfish, for he paid the bulk of the direct taxation, which fell almost exclusively on land. As the eighteenth century advanced, the landed class became more obviously a minority, but a minority which set a high standard in parliamentary oratory, in patronage of art and letters and music, in the achievements of architecture, in all the refinements and amenities of life, the things which make this period so delightful for posterity to contemplate. It was in 1765 that Sir William Blackstone began his codification of the laws of this minority civilisation. Here is the summing up of his philosophy of history:—

> Had not a separate property in lands as well as movables been vested in some individuals, the world would have continued a forest, and men would have been animals of prey; which, according to some philosophers is the genuine state of nature. Whereas now (so graciously has Providence interwoven our duty and happiness together) the result of this very necessity has been the ennobling of the human species, by giving it opportunities of improving its rational faculties, as well as of exerting its natural. Necessity begat property; and, in order to ensure that property, recourse was had to civil society, which brought along with it a long train of inseparable concomitants; states, governments, laws, punishments and the public exercise of religious duties. Thus, connected together, it was found that a part only of society was sufficient to provide, by its manual labour, for the necessary subsistence of all; and leisure was given to others to cultivate the human mind, to invent useful arts, and to lay the foundations of science.

Few statements could better illustrate the complacency so characteristic of eighteenth-century mentality. Moreover Blackstone's analysis is as notable for what it omits as for what it says. It omits the fact that the labouring classes were

in a great majority; that they were denied most of the rights of citizenship; and that, in war time, they had to provide, compulsorily, the naval and military service.

Before the great legal changes of the nineteenth and twentieth centuries, landed property in England exemplified some of the characteristics of a small, stable, patriarchal society. On the principle that the land must go to the heir, the freeholder's land could not be touched by creditors of the deceased; the creditors must recoup themselves from the personalty. The wives and widows of the landowning class were protected, as no other elements in society were protected, from the danger of falling into penury by institutions such as the dower whereby, on marriage, the husband created a landed endowment, usually for the joint lives of husband and wife, with remainder to the widow. Even the humble copyholder might secure a similar protection for his widow, for she might enjoy the copyhold during her widowhood as a right of "frankbench." These rights of widows could be enjoyed only so long as they remained unmarried and chaste. In private law, therefore, land was the medium by which one provided for one's widow and descendants; though in England the principle of primogeniture encouraged the younger sons to embark on a profession or engage in overseas trade. Indirectly, it was the long war against Louis XIV which created an alternative to land as a means of safeguarding one's dependents and successors. That war necessitated the raising of large sums by national loans, some of them for as long as 99 years; the investor in such loans could therefore provide for his dependents a security which formerly was available only for the landed classes.

How were the lower classes affected by this system? By the end of the eighteenth century there were about 200 felonies, all punishable by death and confiscation of goods.

Most of these felonies arose from violation of property rights, including the theft of five shillings. To-day we find it difficult to understand how such brutal penalties were imposed for almost trivial offences; but some responsible contemporaries expressed the view that this savage protection of property was proof, not of brutality, but of the high level of English civilisation. Protection of property always comes before protection of the person, if only because inanimate things cannot defend themselves; often the person was protected solely because of his property. Take, for example, the abduction of a woman. If she had no landed property, the abductor could go ahead, as there was no law to stop him; but if she had landed property of a certain minimum value, then her abduction was felony, punishable by death. Take the case of a servant or apprentice who is so grievously assaulted by an intruder that he is unable to work for some time. In this case it is the master who has the action—a property action—against the assailant, not for personal injuries, but for the material loss consequent on the servant's enforced absence from work. Take an escaped negro slave. His owner might wage an action of trover or trespass against the person harbouring him. Of all this, the woman provided the clearest illustration. As a child, she was subordinate to her father. On marriage, she was given away by one man to another man. As a married woman, she retained certain restricted rights over her real estate, but her personal property, including money, jewels and even the clothes she wore, she surrendered to her husband. In giving up her personalty she gave up her personality. But the odds were not all against her. Often she made up for her rightlessness with her tongue, to such an extent indeed, that, in the past, silent women were at a premium; and you will recall King Lear's words of Cordelia: 'her voice was ever soft, an excellent thing in

woman.' Moreover she might contract debts for which her husband alone was responsible. If he was unable to pay, he went to the debtors' prison, not as a punishment, but on the principle that his body provided security for the debt—one more illustration of the subordination of the person to property.

In the theory of the state, as in the principles of private law, property had the same dominance. Locke maintained that the main function of the state was to protect rights of property, in which, however, he included life and liberty. Hume maintained that as justice consists in rendering unto every man his due, this quality is conceivable only where there is property. As property was inseparable from justice, so it was inseparable from liberty. This may seem paradoxical to us. An illustration was provided in 1712 when a statute imposed a freehold qualification of the value of at least £300 per annum on all burgesses in the Commons. Now this was a perversion of the old constitution of parliament. Historically, the knights of the shire had represented land, while the burgesses, originally townsmen, were supposed to represent trade. By this statute, the burgesses are added to the landed representation; in effect, also, this measure excluded a number of rich merchants from the Commons. We today would regard this as a narrowing and even weakening of the legislative body. But contemporaries took the opposite view, for the preamble to this statute stated that, by this landed requirement, the liberty of parliament would be more adequately secured. Liberty against what? Against the prerogative which, in continental countries, could ride roughshod over representative institutions because there the third estate was a true estate, consisting only of townsmen and burgesses, who were powerless because they did not have the backing of land. The same situation—the

social and political monopoly of the landed freeholder—can often be paralleled in the history of the thirteen American colonies.

It is obvious that such a deeply-rooted system was not likely to disappear overnight. When was it first challenged? I think that the first challenge came in 1753 in the fierce debates, in both Houses, over Lord Hardwicke's Marriage Bill. To-day we regard that Bill as reasonable and salutary because it tightened up the law of marriage, mainly by requiring the publication of banns and the performance of the ceremony in a place of public worship. This was intended to obviate the irregular and secret marriages by which women of a certain class lured wealthy young heirs into matrimony. But the opponents of the measure contended that the Act was designed solely in the interests of the propertied classes, and was unfair to the poor, because of the fees which had now to be paid. For perhaps the first time in the Ancien Régime there were brought into sharp contrast these two conceptions of marriage—the one based on natural inclination, intended to meet a human need; the other based on prudence or calculation, intended to retain large possessions in the same social class. Hence, advocacy of the repeal of the Marriage Act urged, later in the century by C. J. Fox, was regarded as a popular, even radical reform. In this way, public attention was focused, for the first time, on what now seems to us a monopolist, exclusive element in the constitution of the older English society, but it was long before freehold lost its prerogative.

What factors favoured this long, silent revolution whereby the basic structure of English society was slowly transformed? There were many. Great wars, as usual, made their contribution, notably the War of the American Revolution, followed so quickly by the Jacobinism of the French Revo-

lution. The Industrial Revolution greatly increased the pressure from the unenfranchised, outer ring. The Dissenters, from Defoe at the beginning the century to Priestley and Price at the end, waged war on the rampart of privilege. The movement for prison reform, led by Howard, prepared the way for other humanitarian measures, such as the abolition of the Slave Trade, the abolition of slavery in the colonies, and the drastic reform of the penal code. The Reform Bill of 1832 was only the first step in the process of parliamentary enfranchisement; at long last, in 1848, with the abolition of the Corn Laws, the prerogative of the landed freeholder was seriously undermined. All these movements, spread over a long period, had this in common that they were directed to the emancipation of the common man, unendowed with property.

This newly discovered humanity found expression in many forms. The Dissenters, from their position on the margin of society, could see things in a perspective unattainable by those in the privileged, central enclosure; they were behind practically all the progressive and humanitarian movements. The Methodists introduced an introspective and even spiritual element into the lives of the underdogs, by insisting that God cared for them, not collectively and abstractly, but personally and individually; indeed, Wesley's popular hymn 'Jesus, lover of my soul' provided the antithesis to the older conception of the Diety, whose function was held to be that of preserving in the existing order and keeping the poor in their place. Moreover, in the century and a half after 1688 men were becoming less theological, but not less religious; and the absence of plague after 1665 served to diminish the force of the old argument that disease and famine, like tyrannical government, are sent by God to punish us for atheism and debauchery. Parallel with this recession of dog-

matism, there was a new type of philosophy, developed mainly by Locke and Hume which, by focusing attention on the problem of the links between sensation and experience on the one hand and intellectual processes on the other, brought into greater prominence the subjective element in man. Another influence was that of women. Though still denied legal rights, they experienced a social emancipation which brought them to a nearer equality with man, particularly educated men. Generally, they helped to diminish the pedantry, the acerbity, the coarseness of the old man-made society; often their commonsense realism provided a corrective to the egotism of the male. Finally, in this enumeration of less obvious movements in English life, I would include smoking, which steadily increased in the seventeenth and eighteenth centuries. Call it a drug or a poison if you like; but it did help to mitigate the uncompromising angularity of the older world and to foster, as by a sedative, the spirit of concession and compromise. It is possible that, if Charles I or even Archbishop Laud had been in the habit of smoking a pipe, there would have been no Civil War. A civilisation without nicotine may be highly virtuous and exemplary, permitting no compromise with sin or error; it will abound in saints and rigorists, but also in martyrs and massacres.

My own impression is that today human personality is richer and deeper than it ever was before. My evidence may not be very convincing, but here it is. First of all, modern portraits often reveal more complicated and developed personalities than are shown by those of the past, in which a certain rigidity, or angularity or even tenseness can often be detected. Also, there is, I think, general agreement that, at least among the English-speaking people, there is now a higher standard of honour and of humour. As regards honour, formerly men stood on their oath, with the result

that oath breaking became a habit; today we all stand on our honour, and that cannot be violated with impunity. Then as regards the sense of humour. Originally, humour meant one of the four humours, and had nothing to do with our sense of the incongruous or irrational, based on an appreciation of balance and perspective. Our sense of humour today is incompatible with the coarse practical joke, but it is not incompatible with tears, which may provide a catharsis, as we contemplate, with amused sadness, the follies of human life, including our own. In this sense humour means a sense of proportion and a spirit of toleration. The dangerous nations are those which have no sense of humour.

I am suggesting that personality has gradually evolved from property through the intermediate stage of status. That our conception of personality today is much richer and more complicated than in the past is evidenced in the great increase in the number of words used for the analysis and description of the many shades of character and temperament. Here I am not thinking of new or coined words, such as one finds in modern psychology; I have in mind old, respectable words, originally used of inanimate or barely animate objects, and now used also in a referred and subjective sense. A simple example is the word 'starchy' to describe a straight-laced inflexible person. This word was made possible by the introduction of starch into England from Holland in the later sixteenth century. Astronomy provides some such words, as martial, saturnine and loony; medicine supplies others, as phlegmatic, lymphatic, sanguine and sardonic—the last, a useful word, derived from the *risus sardonicus*, or involuntary and ghastly grin produced by the facial muscles in some cases of poisoning as, in ancient times, by a herb found in Sardinia. The words cynical and stoical recall Greek philosophy. The word tolerant is useful for my purpose.

Originally, it meant tolerant of something material, such as a poison or hard work or exposure; not till the nineteenth century did it come to mean tolerant of other people's opinions. We know that the words honour and humour have many old significations, but it is not till the nineteenth century that we find the expressions 'a sense of humour' and 'a sense of honour.' Always, in the vocabulary which I have in mind, there has been an advance from the objective to the subjective, in order to meet the demands in our vastly more complicated diagnosis of personality. So great are these demands that we are even obliged to appropriate words from other countries, notably Scotland, where harsh conditions and an unusually perceptive peasantry helped to enrich the vocabulary with words denoting the various shades of caution, and sarcasm—not an unkindly sarcasm, but the expression of a somewhat diffident and critical attitude, contrasted with that prevailing in more prosperous England, where rank and wealth have always been regarded with greater awe. Examples are the words canny, cosy, feckless and pawky. Of these, the last exemplifies a typically Scottish attitude; but I can best illustrate it by an example not from Scotland, but from Texas. In Austin, as you know, the University of Texas is very large, and accordingly deaths among its senior members are regrettably but inevitably frequent. So the flag on the campus flag staff is often at half mast. Recently, two senior and very distinguished professors happened to meet under the flag staff. Number One, pointing to the flag at half mast, remarked: 'A lot of deaths recently.' 'Yes,' replied number two, 'but they are always the wrong ones.' That remark revealed a pawky character.

In conclusion, it must be obvious to all who have read thus far that the subject is full of unsolved problems—problems shelved or obscured by modern Psychology, which explains

so much by the use of an entirely new and impressive terminology. The study of the evolution of human personality has thus been side-tracked by a new approach. I am well aware that, when we speak of the more highly developed personality of modern man, this may mean no more than that, like the physician, we have now a better technique for diagnosis; just as the doctor identifies and names diseases, existing at all times, but never before classified, so we may be merely applying a larger vocabulary for description of what has always been there. On the other hand, there may have been actual development, just as new disorders and new tolerances are created by new conditions. I have expressed the view that, historically, there has been an enlarging and deepening of human personality, in at least the western hemisphere, mainly through the intermediate stages of property and status. Of the factors which have promoted this evolution I regard Christianity as the most potent and the most complicated—complicated because Christian doctrine has itself experienced an evolution, which has resulted in a division into different and even hostile camps. Nevertheless, in spite of these differences, I think that the western, or at least the Anglo-Saxon mentality is distinguishable from both the Ancient and the Oriental mentality—distinguishable is perhaps too mild a word. The late Lord Curzon once publicly proclaimed that there are two kinds of truth, western and oriental, the first being vastly superior to the second; but, while few of us have either the courage or the social status necessary for such pronouncements, we may feel that His Lordship was giving a clear and downright answer to one of the many questions implicit in this essay.

David Ogg

KIERKEGAARD'S LYRIC OF FAITH: A LOOK AT *FEAR AND TREMBLING**

PROBABLY no book of Kierkegaard has been so widely read and so universally misunderstood as *Fear and Trembling*. In this paper I do not propose to enter into controversy with the existing interpretations of the book. I shall offer my own reading in the hope that it will show itself faithful to the letter and spirit of Kierkegaard's text. To those conversant with Kierkegaard scholarship, my differences from his other interpreters and the grounds of these differences should be evident from the following discussion.

Fear and Trembling is about faith. More specifically it is about Father Abraham and the Old Testament story of his near-sacrifice of Isaac. Kierkegaard is not interested in the historical and critical questions that might be raised by an exegesis of this text. He is concerned solely with the *figure* of Abraham, whom he regards as a *paradigm* for the life of faith. He allows his pseudonym, the poet John of Silence, to accept the data of the Abraham story as set down in the book of Genesis, and to extrapolate the meaning of faith lyrically and problematically from the given account.

In the career of Abraham, Kierkegaard discovers two *movements*, which he calls the movement of infinite resignation and the movement of faith. In obedience to God's command Abraham is prepared to sacrifice Isaac: this is his infinite resignation. By giving up Isaac he gives up the meaning and content of his own temporal existence for the sake of his relationship to God. But even while he climbs Mt. Moriah and draws the knife, Abraham *also believes* that God will restore Isaac to him *in time:* this is his faith, by which he re-

* A paper delivered before the Rice Historical Society on November 12, 1959.

covers his own life with its finite hope and its finite joy.

Kierkegaard assumes that Abraham's infinite resignation is humanly intelligible, and I think we may agree with him. We know what men will sacrifice for love. What might a man not sacrifice for the love of God? But Abraham's faith, Kierkegaard insists, is essentially absurd. To know that Isaac must be given up *in time* and yet to believe that he will be restored *in time* is a contradiction no logic can resolve. Again we may agree: this faith is absurd.

Nevertheless John of Silence praises the life of faith. The obvious question is, Why? What other than madness could motivate such an absurd belief? John of Silence describes Abraham's faith as a "humble courage."[1] But is it really humility and courage? Is it not rather presumption or despair? This is the question I shall try to answer, and by answering it try to make explicit what Kierkegaard means by faith.

In the spirit of Kierkegaard's poet I shall begin with a panegyric of my own—a sympathetic delineation of Abraham's predicament—and then go on to suggest some problematic conclusions.

I

"And God tempted Abraham and said unto him, Take Isaac, thine only son, whom thou lovest, and get thee into the land of Moriah, and offer him there for a burnt offering upon the mountain which I will show thee" (Genesis 22: 1-2).

The command must have paralyzed Abraham. Was not Isaac the son of the covenant, born to Sarah in her old age, when it had ceased to be with her after the manner of women? Was he not the son of the promise by the faithfulness of God?

And now the same God by whose faithfulness Sarah had

conceived and borne a son commands: Take Isaac, thine only son (what that 'only' must have meant to Abraham!), whom thou lovest (can we imagine how Abraham loved Isaac?), and sacrifice him.

What can Abraham do? Tortured by the contradiction, he can curse God. He can hold up his life, with its tragedy, as an irrefutable protest against God and God's world. This we can certainly understand if we can understand a man like Ivan Karamazov. We can understand that a man might so defy God, and there is no small heroism in the defiance. But there is also (as in Ivan's case) unrelieved misery and perdition. What is it to be damned if not to be without God in the world, and therefore to live without joy or light or even hope?

Abraham can cling to the covenant, of which the living presence of Isaac is the fulfilment. He can refuse the command to sacrifice Isaac, and by insisting on his possession of him, refuse to let God play Indian-giver. I think we might understand this very easily. Who would not choose to keep what he had—the son that had been given him—rather than stake everything on the decrees of an inconstant God? Why give up the good one has—for nothing. For the command to sacrifice Isaac carries no promise of reward: if you sacrifice Isaac, I will give you. . . . It is a blunt and unqualified command.

Let us suppose Abraham decides to keep his son. Does he really possess *Isaac*? Can he escape the realization that he has kept Isaac in despite of the command of God and that his possession of Isaac is unlawful? Can he avoid the knowledge that he is a bastard father? Isaac is the son of the promise, the faithful fulfilment of God's covenant. But the Isaac that Abraham might keep in the face of God's 'No' is the son of defiance, the fruit of Abraham's self-will. He is not the son

"whom thou lovest" because he was *given;* he is the son of rebellion whom Abraham has *taken.*

Can Abraham possess Isaac on these terms? Can he enjoy the possession of this stolen son? If he keeps Isaac, is he not a desperate and defiant and damned old man, who *will* have what he wants at any cost, even the cost of making himself godless?

There is a third possibility. Abraham can sacrifice Isaac in obedience to the command, *but conclude* that God is a liar, a monster who seems to fulfill his promises only to withdraw them again, a Caliban whose sport is to torture men. He might sacrifice Isaac, renounce everything, and in so doing lose his trust in God. If he rejects the God of the covenant, he returns from Mt. Moriah without his son, without God, without hope or joy. In giving up Isaac he has given up that relationship to God on which his life was built, and which constituted its inner meaning.

Are there any alternatives left to Abraham? Is there any way for him to get off this contradiction on which he is racked, whole and undefeated? Has he any choice except the despair of having defied God or the despair of having forsaken God? We would not belittle the man who chooses defiance or hopelessness. There are times when defiance and despair are humanly speaking the only possibilities left to a man. Perhaps very few men can even bring themselves to this point.

There is one possibility yet open, not strictly a human possibility, not even Abraham's possibility except in a peculiar sense. It is the possibility of faith.

In this context faith cannot mean the assent of Abraham's mind to the nonsense that he can have his cake and eat it, kill Isaac and keep Isaac. Abraham is no fool, and he is not playing with logical puzzles. He is a sober man, and we are

obliged to assume that no sober man could even propose such foolishness to himself, much less believe it.

Abraham's faith, in this situation, can only mean: *his faithfulness to the faithfulness of God.*[2] He accepts both the covenant that gave him Isaac and the command that deprives him of Issac, trusting that what God had promised He would yet fulfill even though He first took away all He had hitherto given. Abraham believes that *God* is faithful. He does not affirm the covenant by denying the command, nor does he honor the command by relinquishing the covenant. His faith is that *God* is faithful *both* in covenant *and* in command, that God who requires all will Himself provide all that He requires.

Yet this does not mean that he proposes this absurdity to himself as something he must believe. Because he is a man, Abraham cannot *decide to believe* what crucifies his understanding.

How can he then be faithful? By *enduring* the conflict in which his life is torn? No, for endurance is a form of defiance. Endurance means: whatever you send me, God, I can take it. Does he *joyfully surmount* his problem? No, for he is not greater than his own life which is threatened, and to presume to surmount this problem would again be defiance.

Can he continue to believe in God *in spite of* the absurdity and the contradiction? No, this is again defiance. To believe in God in spite of everything is the most extreme form of defiance. If a man wills to believe in God in spite of what God does to him, then he has rejected God.

The fact is that in human (reasonable and ethical) terms, Abraham *does nothing at all.* He is great, Kierkegaard says, by reason of his power which is impotence, great by reason of his wisdom which is foolishness, great by reason of his hope which is madness, great by reason of his love which is

hatred of himself (p. 31). Abraham cannot will the absurdity in whose strength ("by virtue of" which) he is saved and Isaac restored (pp. 46-64 *passim*). He cannot resolve to accept the contradiction; he cannot hope against what he knows. In this crisis he does not draw from himself any resources at all, for he is emptied of all strength and reason and hope by the absurdity of his situation. All that Abraham can do—the only thing that is not defiant—is to *receive* and to *obey*. In receiving what God bestows and in obeying what God demands, he receives the strength to endure and the freedom to rejoice. This is not defiance, because in so enduring and rejoicing he does not rely on himself. "He who loves God without faith reflects upon himself, he who loves God believingly reflects upon God" (p. 47). As over against God there is nothing a man can do but receive and obey.

Yet it seems that Abraham has avoided defiance at the cost of forfeiting his humanity. To receive what God gives and to perform what God requires: is this not a betrayal of human intelligence, human will, and human dignity? Is it not the summation of all the stupidity, all the submissiveness, and all the weakness of which we think when we speak with justifiable contempt of "blind faith"? Is Abraham's faith blind and therefore despicable?

It would be, Kierkegaard says, except for one thing: Abraham *loves* Isaac (pp. 42 ff.). In his obedience to the command he is not blind; he knows what he is doing. When he draws the knife he does not cease to love Isaac as a father loves his son. It is no sacrifice that a slave regards himself as worthless and gives his life for his master. That *is* blind obedience. He gave nothing because he did not love what he gave. Since he did not love himself, he was nothing and therefore had nothing to give. Sacrifice is always clear-sighted. Abraham does not refuse to sacrifice Isaac because he loves him.

Neither does he love him less because he has to sacrifice him. The same is true when he receives Isaac again: if he did not love Isaac, he would have no joy in the receiving. Blind faith is meaningless because it is inhuman. But Abraham is a man, he does everything humanly possible, he loves Isaac as his own life.

Yet confronted with the impossibility of keeping Isaac, he gives him up. He resigns what he loves in obedience to what he cannot understand but cannot reject, and he receives again what he loves by the power of the absurd, a power he cannot comprehend but only believe. That it is better to give than to receive, Kierkegaard says, is the lesser mystery. The greater mystery, the mystery of faith, is that "it is far more difficult to receive than to give—that is, if one has had courage to do without and in the hour of need did not become cowardly" (p. 113). Abraham's faithfulness—his obedience to God's command and his reception of God's gift—is no blind subservience. It is the courageous suffering and the humble joy of a man who has fulfilled and exhausted his humanity. It is not the defiance of a man who will use his freedom—a freedom he has even against God—to damn himself. It is not the servility of a man who will not even be a man, and so being nothing to himself is nothing before God. Defiance and servility are only the counterfeits of Abraham's faith, that dialectical passion of humble courage, whose passion and whose dialectic I have here tried to trace.

"And God tempted Abraham and said unto him, Take Isaac, thine only son, whom thou lovest, and get thee into the land of Moriah, and offer him there for a burnt offering upon the mountain which I will show thee."

Abraham is subjected to a trial. Of course he does not know it is a test of his faith. If he knows this, it is not a trial,

but a competition, an endurance contest between Abraham and God.

Like Job, Abraham has a case at law with God. And like Job, whom Kierkegaard discusses in *Repetition*, Abraham wins his case by the very fact that he loses it.[3] For he loses against God. Woe to the man, Kierkegaard says, who wins against God. Abraham has the strength not to be strong at that point where strength is weakness and weakness strength. He strives with God and overcomes God by his impotence (p. 31). For the faithfulness of God conquers even Abraham's will (which is a real human will) and grants what Abraham by himself cannot attain: Isaac, Abraham's life, Abraham himself. What he once received as a gift, now through his faith he receives again.

Kierkegaard describes faith as the "new immediacy." It is Abraham's receiving again what he was once given, what was his sole desire, and what he has had to give up. It is not that God *requires* Abraham to believe an absurdity, so that we must ask, Why would any man want to believe this? Abraham is in faith *permitted* by the power of the absurd to believe what he must with all his passion want to believe if only he may. The miracle of faith is that a man *may* believe that with God all things are possible, even that impossible thing he himself wants.

Perhaps we can now understand this statement:

> Faith is precisely this paradox, that the individual as the particular is higher than the universal, is justified over against it, is not subordinate but superior—yet in such a way, be it observed, that it is the particular individual who, after he has been subordinated as the particular to the universal, now through the universal becomes the individual who as the particular is superior to the universal, for the fact that the individual as the particular stands in an absolute relation to the absolute. (p. 66)

Abraham was subordinate to the universal: he loved his son

and was a righteous man. He was subordinate to the universal until it broke against the command of God. It is only *through* his constancy in the universal that he comes to this point at which he stands alone before God and is justified because he is strong enough to be weak before God, wise enough to be foolish before God. He is justified *by* God (the absolute), *as* himself (the particular), *over against* himself (the universal). *Through* the universal Abraham becomes the individual justified by God *over against* the universal.

This is the situation of Abraham, as sympathetically as I can present it, and I hope true to Kierkegaard's own presentation. For Kierkegaard, Abraham is the *type* of the man of faith, the paradigm according to which all the cases of faith are to be declined.

But this immediately suggests the question, Why? Why is Abraham the "father of faith"? What is the universal human meaning of this story? On the basis of our consideration of Abraham, can we say anything about the relevance of faith to the life of every man who is not Abraham and not subjected to Abraham's trial?

I shall suggest Kierkegaard's answer to this question in my "problemata," which are the substance of the next and final section of this paper.

II

Abraham's faith as I have described it above is structured by a *dialectic of human possibility*. This dialectic is itself the structure of those "stages on life's way" which in Kierkegaard's thought are the moments in the process of existential self-questioning, self-assertion, and self-discovery. In Abraham's case we have: immediacy (Isaac is given to Abraham and Sarah in their old age), the ethical (Abraham fulfills his

father's duty), and the religious (in resignation he sacrifices Isaac and by faith receives him again).

What follows cannot be a complete account of the stages on life's way, but only a brief sketch of the dialectic of human possibility, designed to show the parallel between Abraham's case and the case of every man.

Every man is by nature an object of concern to himself. If he is not self-concerned, he is no man. Every man is concerned to know and to actualize his peculiar human possibilities.

At first it seems that *all things are possible.* Whatever I desire I can secure for myself: so thinks, for example, the very young child. But it soon becomes clear to this (aesthetic) attitude that the satisfaction of desire is not guaranteed. It is possible that I shall get what I want, but *only* possible, and therefore *im*possible.[4] Perhaps my desires will be fulfilled, but it does not depend on me and my doing. The possibility that my wishes will be granted is not my *possibility* but my *fate.* In reality the freedom of the life of immediacy is a stifling fatalism, born of the knowledge that frustration is as likely as fulfilment and that nothing can be done to avert it. The certainty and finality and untimeliness of death is enough in itself to drain immediate existence of its possibilities and its freedom.

Is there any escape into freedom out of the reign of fortune? Fortune and misfortune are the lords of nature, of that world which the man of immediacy regards as the real world. To escape their sway he must escape the world over which they rule. He may therefore flee to the realm of imagination and reason, to poetry and to philosophy. In poetry and in philosophy it must indeed be the case that *all things are possible.* I can think anything and imagine anything; imagina-

tively and speculatively I can *enjoy* all possibilities indiscriminately.

But in losing reality the poet and the intellectual lose possibility as well. The fancies of poetry and speculation are *only* possibilities; enjoyed for their own sake, they are daydreams. Because they are the products of a retreat from reality, they cannot be realized, and so they are not real possibilities. The possibilities I only think and fancy to myself are not *my* possibilities, just because I have them only in fancy and in thought. The poet and the speculative philosopher are melancholics. They live a life that is cut adrift from the world, sailing forever like the flying Dutchman on a sea of *mere* possibilities.[5]

Thus, following Kierkegaard, a life which is immersed in nature (living out of natural impulse) and a life which is in perpetual flight from natural exigence are equally impossible. They run dialectically into the same impasse: both are destructive of the real possibilities of human life. The aesthetic mode of existence results finally in a corrosion of individuality and a dissolution of personality into blind fatalism or effete detachment.

The ethical understanding of life seems to open a way out of the aesthetic impasse. The moral man thinks he can discover his real possibilities in a life of freedom made actual in decision. By *choosing* to be what I am, he thinks, by making my possibilities my own, I shall make my own possibilities. In freedom I create myself—not *ex nihilo* of course, but by taking as my own, and making myself responsible for, that life which in fact I have. Whatever I am, therefore, I am by my own will, for I accept and affirm myself as what I am. Whatever I am is my own self-chosen and self-realized possibility, and therefore my possibilities are all mine. *All things are possible* to me because I am a being who in freedom can

and does choose to be whatever he is and to do whatever he does.[6]

But this ethical mode of existence, Kierkegaard holds, is also self-destructive, because it is premissed on a basic dishonesty about what it means to be human. Ethically regarded, I am an autonomous man. I acknowledge only that law which is prescribed by my own humanity, and I require myself to justify by that law whatever I do. I am to be my own legislator, plaintiff, defendant, judge and executioner.

But can I in fact justify myself before the law that is (autonomously) written in my heart? Kierkegaard says, No. Suppose, for example (to use Kierkegaard's own illustration), that I want to have a holiday in the park. Can I justify this diversion ethically? Actually I cannot, for there is no dialectic by which I can bring this harmless and accidental triviality into relation with my self-imposed duty. I cannot see in this simple recreational activity a fulfilment of that law by which I presume to determine myself. If I am at all honest, I cannot avoid the conclusion that I have my holiday just because I *want* to. As a human being with ordinary human needs and desires I cannot carry out the project of living ethically.

Thus I arrive at the paradox that as a free man I cannot go for a holiday in the park. I cannot make it my duty to go to the park, or as Kierkegaard says, I cannot express the universal in this and every particular. I am involved in a contradiction between my assumed autonomy and my recalcitrant humanity. As a free man I am a slave to my own freedom.

But (to continue the figure) I do go to the park in a thousand ways every day. Not only in actions that are manifest, but in countless invisible thoughts and subtle inclinations, I live extraneous to my conception of myself and my duty.

For this reason, Kierkegaard says, I must acknowledge the ineluctible and absolute *guilt* of my situation as an ethical man.[7]

To speak of absolute guilt may seem extreme. But Kierkegaard wants to say that to be human is literally to be in extremity. To be human means, in ethical terms, to take your life into your own hands. By Philistine or by aesthetic standards this is excessive. Nevertheless the ethical freedom of man (and therefore the basis of human equality, Kierkegaard's "universal") is just this fact, that he may take his life into his own hands, and to do so is an extreme thing.

The extremity in which I am, therefore, is guilt. My guilt, however, is not that I intermittently or even regularly fail to do my duty. Guilt names a contradiction implied by my very human self-assertion. My guilt is not that I sometimes fail; it is rather that I *undertake at all* to be my own justification and my own destiny. Guilt is the dishonesty of conceiving human existence in terms of ethical autonomy.[8]

The ethical man's life expresses his conviction that all things are possible to freedom. But his life includes the contradiction that *nothing* is possible to freedom. His own life, with its holidays in the park, is not possible. It is unjustified, it stands outside of and is condemned by its own law. And the impossibility of a self-justifying human life is absolute guilt.

Thus the endeavor by a human being to comprehend and enact his own existential possibilities, by freedom, runs like the aesthetic life into a dead end. No particular theory of ethics is in question here; rather, the assumption of freedom necessary to any ethical self-understanding is self-contradictory. Guilt is the explicit existential predicament in which the self-annihilating consequences of ethical freedom are made manifest. Guilt is just the moral situation of man as

such, and in guilt the impossibility of achieving selfhood by freedom is made actual.

Now we have come to the essence of Abraham's stalemate. Isaac, whom he could not have by nature, he cannot have by freedom. He cannot give Isaac to himself by freedom, as Isaac was not his by nature in the first place. And Isaac is Abraham's own life. Isaac is lost.

But at this point—and this is the one point Kierkegaard wanted to make—comes the command to *give up* Isaac.

In what form, generally, does this command come, and what does it mean to men in general? For Kierkegaard the command to give up Isaac meant the claim of *religion* that only the man who loses his life shall save it. In particular this is the claim of Christianity, with its doctrines of creation (immediacy), sin (the ethical), and redemption. If Abraham believed by virtue of the absurd, Christianity was for Kierkegaard *the* Absurd: the absurdity that in the aesthetic and ethical impotence of man, his being is first definitively and positively made possible, by a power which is only effective when it is most impossible. The Christian doctrine of redemption and recreation is the impossible possibility, the offense, the contradiction and the Paradox by which alone health of the spirit is possible.

Apart from theological considerations, the existential meaning of Christian faith is the same as that of Abraham's faith: the life which is not to be had by nature (aesthetic) and cannot be won by freedom (ethical) must be given up. Then and only then (you may believe this miracle) it will be *given again* to him who is at once able to renounce it and happy to receive it. As Kierkegaard puts it:

> God *is* that all things are possible, and that all things are possible *is* God; and only the man whose being has been so shaken that he became spirit by understanding that all things

> are possible, only he has had dealings with God. (pp. 173-174)

This is a translation into reflective terms of that text of Paul from which the title of Kierkegaard's book is derived: "Work out your salvation with fear and trembling. For it is God which worketh in you both to will and to do of his good pleasure" (Phil. 2: 12-13).

Religious faith is faith in the absurdity (not *demanded* of a man, but *allowed* him) that with God *all things are possible,* even his own life, if he will receive it as a gift after having given it up as his right. The relevance of the absurdity to every man is that the absurdity is the only possibility for human life that is not self-destructive. Faith is man's only possibility this side of despair.

It is Kierkegaard's belief that the human situation is essentially a religious situation. And that means, a situation in which man confronts the absolute power and reality. This he does in the absoluteness of his own extremity, in that extremity of guilt in which his self is trapped and stifled. This situation is religious in the sense that it leaves no alternatives but faith or despair. *Either* the recognition that the only possibility open to me is not my own, but the absurd power of God; *or* the annihilation of my self in defiance of this power. The command to give up Isaac contains dialectically the impossible possibility of his restoration. Only the man who loses his life shall save it, and it is saved for him in his very act of giving it up. Resignation and faith therefore become two aspects of one and the same thing: the impossibility of the self (humanly speaking) is the arena in which (divinely speaking) all things are possible.

At this point, unfortunately, it must be said that Kierkegaard was so ingenious at depicting the conflicts of faith—

its dread and distress, its fear and trembling—that he outsmarted himself. In the *Postscript* Kierkegaard wrote: "While aesthetic existence is essentially enjoyment, and ethical existence, essentially struggle and victory, religious existence is essentially suffering, and that not as a transitional moment, but as persisting."[9] This statement bears witness to Kierkegaard's own contention that subjectivity is truth,[10] and that a man can understand no more than his life expresses.[11] He himself was so full of *Sturm und Drang*, so romantically absorbed in his own genius and the sufferings of his genius, that he never gave up Isaac. *Pace* his uncritical biographers, he never really relinquished Regina. He tricked himself out of her by trying to give her her freedom, and by presuming to give her her freedom, he played God with her. If I had had faith, I would have married Regina, he declares in a moment of complete consistency.[12] But he did not have faith, and he did not marry her. Because he had to be a genius (aesthetic), he never became a man of faith or a husband. Instead he made a life and a career for himself out of poising on the thin edge of resignation. Consequently his understanding of faith was always only a poetic understanding.

On his own showing in *Fear and Trembling* the statement above should conclude: religion is suffering constantly overcome by *joy*. How else can we understand the joy of Abraham when he returns home with Isaac after his trial? But in the very same book Kierkegaard gives us a picture of the "knight of faith"—with his make-believe wife preparing a little make-believe supper—that is sheer self-deception, Kierkegaard's own self-deception (pp. 49-51). If the argument of *Fear and Trembling* is correct, faith is not make-believe or irony, but the power which makes life possible. To have faith, Kierkegaard said, is to be out over 70,000 fathoms of water—and to be glad. But when he himself ventured out on

the deeps, he was like St. Peter walking on the water: he couldn't help wondering how he did it, and so he sank.

This was Kierkegaard's personal problem, but it reflects and is reflected in his discussions of faith, which build up to the point of indicating the relevance and the meaning of the absurdity—but then tend to dissipate in arch, ironic, or merely clever delineations of the life of faith, or else to remain in uneasy equilibrium at the point of resignation, cultivating for its own sake the fear and trembling of the religious crisis. Sometimes the books, like the man, succumb to the demonic temptation, always at hand in the religious life, to confuse oneself with God. The concrete delineation of the meaning of faith, of the very worldly sense in which human life is possible if it is lived by the power of the absurd: this is what Kierkegaard cannot consistently supply.

The purpose of this paper has been to describe the nature of faith and the relevance of faith as Kierkegaard sees them. All I would here claim for Kierkegaard is that he does define the dialectic of human existence by which, in which, and to which alone the claim of religion is meaningful. And in a formal way he has understood the situation of the religious man, the man who lives by virtue of the absurd, by a power which is not his own and which he cannot understand, but which he also cannot refuse without at the same time denying himself. The joy of this situation, the substance of that life which a man has at the hands of God, is something which Kierkegaard, like his poet John of Silence, could only marvel at but not comprehend.

Louis H. Mackey

NOTES

1. Søren Kierkegaard, *Fear and Trembling and The Sickness Unto Death*, Garden City, 1954, p. 59. This paperback is a revision

and correction of the hardcover edition. All further references to *Fear and Trembling* in this edition will be set in parentheses in the text.

2. This phrase has echoes of Karl Barth's *The Epistle to the Romans,* but nothing of Barth's meaning is here implied.
3. Cf. Kierkegaard, *Repetition,* Princeton, 1946, esp. pp. 110-113, 121-134, 149-159.
4. Cf. Kierkegaard, *Concluding Unscientific Postscript,* Princeton, 1944, pp. 121-122.
5. Cf. Kierkegaard, *Either/Or,* Garden City, 1959, Vol. I, "Diapsalmata" *et passim,* and Vol. II, "Equilibrium." Cf. also *Concluding Unscientific Postscript,* Bk. Two, Pt. Two, Ch. III.
6. Cf. *Either/Or,* Vol. II, *loc. cit.*
7. For Kierkegaard's elaborate and masterful "Deer Park" parable, see *Concluding Unscientific Postscript,* pp. 422-446.
8. Cf. *inter alia Either/Or,* Vol. II, "Ultimatum," and the discourse *Purity of Heart,* New York, 1938, *passim.*
9. *Concluding Unscientific Postscript,* p. 256.
10. *Ibid.,* Bk. Two, Pt. Two, Ch. II.
11. Alexander Dru, *The Journals of Søren Kierkegaard,* London, 1938, No. 870.
12. Cf. *ibid.,* No. 444, No. 367.

THE BRAIN AND BEHAVIOR*

PSYCHOLOGISTS, because of their interest in developing ways of explaining and predicting human behavior, find it necessary to understand the physical and physiological characteristics of human beings. Any scientific analysis of behavior must take into consideration the structural factors or mechanisms which might be involved in the relation between environmental conditions and behavior. A psychology developed in ancient times, or in other parts of the world, might have directed its attention to the heart and the circulatory system or to the diaphragm and the respiratory or "pneumatic" system (Magoun, 1958; Veith, 1958; Woollam, 1958), but psychologists in Europe and America during the past hundred years have been concerned with the central nervous system as the relevant physiological mediator between environment and behavior. The purpose of this paper is to describe the neurophysiological model current around 1900 which was proposed as such a mediating mechanism and to contrast the simple, machine-like conception it involved with the complex model which more recent neurophysiological work requires.

Neurophysiologists are in agreement in dating the beginning of the modern period of research on the central nervous system to the observation in 1870 by two German neurosurgeons, Fritsch and Hitzig (1870), that an electrical current applied to the surface of a dog's cortex resulted in movements of the legs on the opposite side of the body (cf. Ferrier, 1886, p. 223; Penfield & Rasmussen, 1950, p. 12; von Bonin, 1950, p. 11; Konorski, 1958, p. 1102). The effect of

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their experiments which provided a new direction for research has been described by Konorski (1958) as follows: "From that time onwards, in almost all countries, but especially in Germany and England, various fields of the cortex were intensively explored with the aid of two methods: stimulation of various points of the exposed cortex in an anaesthetized animal, and testing of the results of ablation of particular areas after the animal has awakened from anaesthesia. The investigations were so numerous and rich in results that by the turn of the century, the chart of the function of the cortex of animals (rabbits, cats, dogs, monkeys and apes) was essentially completed, and, what is more surprising, it has proved to be not very different from that worked out more recently with the aid of infinitely more perfect methods. The investigations demonstrated that the cortex comprises the so-called projective (sensory) areas representing a cortical counterpart of particular receptor surfaces, the motor area, involved in voluntary movements of particular parts of the body, and areas of undefined function, which expand with the phylogenetic development of the brain and which were most frequently referred to as associative areas. As a rule, the results of the investigations were in conformity with the results of respective histological studies.

"However, it is interesting to note that after this general scientific assault, when all the positions susceptible to conquest with the aid of the methods then available had been tackled, development along this line suddenly came to an end. It seemed that after the functional topography of the cerebral cortex had been mapped out, there was nothing more left to be done in the physiology of the brain" (Konorski, 1958, pp. 1102-1103).

Konorski's remarks characterize the situation in neurophysiology at the turn of the century. An impressive amount

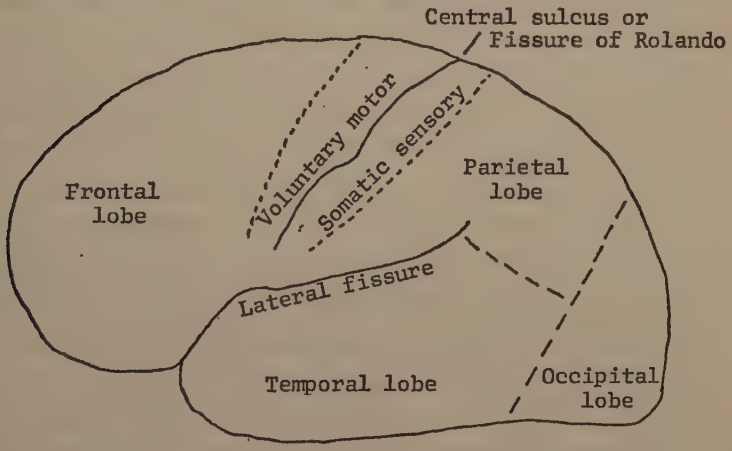
of work had been accomplished; at that time von Monakow (1902) could review 846 references representing research conducted to explore the significance of Fritsch & Hitzig's original experiment. As a result of this research, neurophysiologists of 1900, as Konorski indicated, distinguished three major kinds of cortical areas: (1) sensory areas, which were connected by nerve fibers to the various sensory receptors in the body; (2) motor areas, which were connected by nerve fibers to the muscles; and (3) association areas, which did not respond to stimulation and which were believed to connect sensory with motor areas. The neurophysiological model linking environment to behavior could accordingly be described as follows: external physical stimuli impinging on the sensory receptors set up nerve impulses which were transmitted to sensory areas in the brain where they gave rise to sensations and perceptual experiences; from those areas nerve impulses passed through the association areas which were considered responsible for intellectual and emotional activities; and from there the impulses passed on to the motor areas with a resulting ennervation of muscle fibers and thus movements of the body. The significance of this model for the work of Pavlov, Watson, Hull, and others of the "Behaviorist school" of psychology is, of course, well known. Such a model provides a mechanical conception of human behavior with the brain as a kind of telephone switchboard connecting stimuli with responses.

Research in neurophysiology since 1900 has made it increasingly difficult to accept this simple interpretation of the function of the central nervous system. In the following sections of this paper selected examples of this more recent research will be described to indicate the kinds of neurophysiological data that contemporary psychology now has available to aid in the development of ways of explaining and

predicting behavior. For the purposes of this presentation it is useful to divide the material into three sections, covering research dealing, respectively, with somatic sensory and motor processes, with intellectual processes, and with emotional processes.

Somatic Sensory and Motor Processes

Before describing the research on somatic sensory and motor processes following Fritsch & Hitzig's discovery, it will be necessary to describe briefly some of the gross anatomical



Side view of the human cerebral cortex

characteristics of the human cerebral cortex. Four major regions or lobes are usually distinguished for each cerebral hemisphere as indicated in the accompanying diagram, although the anatomical boundaries between each area are not in all cases clearly specifiable. The frontal lobe includes that portion of the brain anterior to the central sulcus or fissure of Rolando and superior to the lateral fissure. The parietal lobe extends from the central sulcus posteriorly and is

bounded by the lateral fissure. The temporal lobe is marked off by the lateral fissure and extends laterally and ventrally. The occipital lobe is located at the rear of the cerebrum, but is not separated by any major fissures. (For the purposes of this paper it will be appropriate to consider cortical areas in animals as comparable to those described here for the human cortex.)

The work that had been done by 1900 placed the cortical representation or projection of somatic sensory processes in the parietal lobes in a narrow region adjacent to the central sulcus. The motor processes were localized in the frontal lobes just anterior to the central sulcus. Along each of these narrow strips it was possible to identify topographical representations of the body for both sensory and motor processes beginning at the top of the hemisphere and extending down the side in the following order: foot, leg, trunk, neck, arm, hand, face, and throat (Ferrier, 1886, Ch. VIII; Sherrington, 1906, Lecture VIII). More recent work using more refined techniques has substantiated these early finding (cf. Penfield & Rasmussen, 1950, pp. 213-216), but has made it necessary to change the interpretation of their significance. In order to be able to clarify this change in interpretation it will prove helpful to describe in some detail the procedures involved in systematic electrical stimulations of the human cortex during operations on the brain.

Penfield and his colleagues (Penfield & Rasmussen, 1950; Penfield & Jasper, 1954) have performed more than four hundred operations on the human brain for the removal of tumors or other sources of epileptic disturbance. In order to insure the excision of all the diseased tissue it is necessary to identify precisely the limits of the pathological area. At the same time precautions must be taken to minimize interfer-

ing with those areas of the cortex which are essential for normal body function. Thus electrical stimulation of the cortex has a practical relevance for the treatment of the patient undergoing surgery. For the neurosurgeon the value of the results of this stimulation for establishing neurophysiological generalizations is secondary. Nevertheless, over the years Penfield and his colleagues have collected sufficient data from cortical mappings to be able to describe certain characteristics of the surface of the cortex in considerable detail.

The actual stimulation procedure is comparatively simple once the surface of the brain has been exposed. An electrode providing a brief current (a fraction of a millisecond) at voltages from ½ to 5 volts is touched to some point on the surface of the right hemisphere of the cortex. The patient, who is conscious throughout the operation, may report a tingling sensation on the upper portion of the left leg, flex the left hand, or perhaps contract the left leg. The location of each response is marked with a numbered ticket; a secretary records the numbers and the responses, and the total surface area with tickets affixed is photographed. After the excision of the pathological tissue, further stimulation may be carried out. Then the incision is closed. (Cf. Penfield & Rasmussen, 1950, pp. 4-9.)

As indicated above, the cortical diagrams Penfield and his associates prepared using all the apparatus available to modern neurosurgery were in substantial agreement with the diagrams prepared from studies of animals before 1900. But in the course of their work and the work of other neurophysiologists it became more and more difficult to understand the function performed by the sensory and motor projection areas in the mediation of environment and behavior. These difficulties arose in the course of investigations designed for

three different purposes: (1) to specify more precisely the actual cortical points of stimulation and their effects, (2) to examine more closely the sensory and motor processes related to electrical stimulation, and (3) to determine the effects on behavior resulting from the surgical excision of cortical tissue.

(1) Attempts to specify more precisely the cortical points of stimulation and their effects ran into two kinds of difficulties. First, repeated stimulation of the same location for a particular patient did not always elicit the same response. Depending on other conditions, not all well understood, the stimulation of a point which had resulted in a particular response might yield the opposite response, a response appropriate to an adjacent area, a combination of several responses, or no response at all. Second, although the topographical mappings from patient to patient showed the same general order, the cortical location and the amount of tissue involved varied widely. For surgical purposes it was necessary to replot the effects of electrical stimulation for each patient (Penfield & Rasmussen, 1950). Not only were the responses to stimulation variable, but the tissues themselves varied greatly. Detailed histological studies of the cortex measuring surface, volume, thickness, number of neurons, and density, among other characteristics, reveal such variability between specimens that statistical analyses are coming to be accepted as necessary procedures (Lashley & Clark, 1946; Sholl, 1956). Lashley (Jeffress, 1951) found that animals grossly indistinguishable in behavior might have brains which differed by 100 per cent in the average size of cells in certain sections of the frontal lobes or by 50 per cent in the number of nerve cells in the temporal lobes; certain cells present in one brain might be absent in the other. Lashley concluded that "the anatomic variability is so great as to preclude . . . any theory

which assumes regularity and precision of anatomic arrangement" (Jeffress, 1951, p. 70).

(2) The studies designed to examine the sensory and motor processes relating to cortical stimulation were primarily concerned with the kinds of sensations and movements elicited. Penfield's observations are particularly pertinent in this context: "The sensation elicited was described as tingling, as sense of movement when no movement could be observed, and on the negative side as numbness. The words 'pain,' 'cold,' and 'blood rushing,' which may mean heat, were used only occasionally. Apparently no patient found it disagreeable. No forced reactions appeared as after painful stimulation. These are elements of sensation which do not carry with them specific memories. The patient knew accurately only where the sensation semed to be. He never suggestd that something rough or smooth or warm or cold had actually touched the part, nor did he believe that someone was moving the part" (Penfield & Rasmussen, 1950, pp. 216-217).

"Some of the movements are crude, others complicated, but they are all elementary. Thus, the movements of the contralateral leg and arm are those of simple flexion or extension. The hand opens or closes; no more. In the lower portion of the sensorimotor strip, however, stimulation may produce the following coordinated acts, which are not restricted to contralateral parts but are bilateral: (1) vocalization, a coordinated act carried out by skillful activation of mouth, pharynx, larynx, diaphragm, and abdominal musculature; (2) mouth movements as though eating or sucking, associated with salivation and swallowing; (3) turning to one side with conjugate deviation of the two eyes. The baby is able to do all of these things at birth, or not long afterward. But there is, in all of this, none of the acquired skillful foot movements of the dancer, nor any of the manifold delicate performances

of which the adult fingers are capable. The mouth is never used to form a word" (Penfield & Rasmussen, 1950, p. 217).

It should be obvious from the quotations that although cortical stimulation of the sensory and motor areas produces effects which may be described as sensory or motor, these effects are so simple and so specific that they bear little relation to skilled behavior patterns or complex sensory discriminations. In further cortical explorations Penfield has found some evidence for secondary or even supplementary sensory and motor areas which seem related to more complex behavior patterns for the mouth and hand. However, the effects of stimulation in these areas can be noted only if the region stimulated is already active. Penfield's tentative conclusion is that, although the sensory and motor areas in the cortex may be way stations in the development of complex behavior patterns, they are clearly neither terminals nor points of origin.

(3) Another group of studies explored the effect on behavior resulting from the removal of tissue in the sensory and motor areas. The research on animals has been designed to determine the consequences of destroying individual nerve cells and fibers and of removing larger amounts of tissue. Lashley (1958) reports that more than one thousand cuts have been made in the cortex of the monkey without any discoverable changes in its behavior. In other studies knife cuts have been made in criss-cross patterns across the sensory and motor areas of a monkey's cortex and deep into the white matter of the hemisphere producing not only cell destruction but also severing the connections between cells; again, little or no defects have been reported in learning or the retention of habits (Sperry, 1958). The removal of larger amounts of tissue has been shown to have an effect on an animal's behavior. In Lashley's (1929) work on maze learning

in rats, he found a decrease in their efficiency proportional to the total amount of tissue removed. His experiments failed to demonstrate special significance for any particular area of the cortex. The results of removing cortical tissue from apes and humans, however, can not be understood in terms of this simple quantitative rule.

Operations on the primate sensory or motor areas result initially in some form of sensory deficit or paralysis. Penfield & Rasmussen (1950) report that the removal of the whole sensory projection area from one hemisphere of the cortex results in the loss of the sense of movement and of position in space of the arm and leg on the opposite side. Evidence documenting anesthesia for the area is contradictory, but it is clear that there is no permanent loss of the appreciation of touch, pain, or pressure. Total removal of the motor area in one hemisphere results in complete paralysis of the arm and leg on the other side, which may be accompanied by spasticity of those limbs. However, in a comparatively short time some movement is again possible, and, although the process of recovery is slow, virtually complete use of the limbs has been reported for some patients in less than a year. In other cases recovery never seems to be complete.

Franz (1929) reports that recovery from surgically induced paralyses in monkeys usually takes nine to twelve months. Using systematic exercising techniques coupled with immobilization of the unaffected limbs, he found recovery was substantially complete within thirty days. Application of similar exercising procedures to human subjects with paralyses of four or more years duration yielded similar results. Patients whose arms and legs had been useless became able to use them well enough for running, playing baseball, or sewing. In another kind of experiment Jacobsen (1934) removed the part of the motor area involving the forelimbs in chim-

panzees who had been trained to open problem boxes with those limbs. Even though movement was curtailed by a severe temporary paralysis, the monkeys used their feet to help their arms open the boxes. The results of these and other studies involving tissue destruction or removal in the sensory and motor areas increase our uncertainty about the functions performed by those areas.

The recent neurophysiological research on somatic sensory and motor processes discussed in this section does substantiate the presence of specific areas in the cortex which when stimulated result in sensations or motor movements just as neurophysiologists in 1900 had claimed. However, studies designed to clarify the significance of these areas for the way the central nervous system mediates between environment and behavior preclude the acceptance of any simple, mechanical model. There is too much variability in response to stimulation for one subject, in cortical location and amount of tissue for a particular part of the body in different subjects, and in anatomical and histological characteristics. The kinds of sensory and motor processes which result from stimulation are crude and stereotyped; their relation to complex behavior sequences or sensory discriminations is obscure. The effects of tissue removal in the sensory and motor areas are variable and often only temporary. The available neurophysiological data require a much more complicated model for the explanation of the sensory and motor aspects of behavior than the one available to psychologists at the beginning of this century.

Intellectual Processes

The technique of electrical stimulation introduced by Fritsch & Hitzig left more than half of the cortex unidentified (Ferrier, 1886, Ch. VIII; Sherrington, 1906, Lecture VIII;

Franz, 1907, p. 12). As indicated above, these portions of the cortex were called association areas because they were believed to connect sensory with motor areas. For various reasons the frontal lobes were singled out as the most probable locus for intellectual processes. Data from comparative anatomy identified this region of the brain as the last to develop in mammals and as most highly developed in man (Ferrier, 1886, p. 466; Ariëns Kappers, Huber & Clark, 1936, Ch. X). In addition a number of clinical studies of brain tumors or traumatic lesions in human frontal lobes gathered during the 19th century reported intellectual deficits, although as Franz (1907, Ch. II) has indicated, there were an equal number of cases in which no deficit was reported. In spite of this equivocality Ferrier (1886) felt justified in stating, "We have . . . many grounds for believing that the frontal lobes . . . form the substrata of those psychical processes which lie at the foundation of the higher intellectual operations" (p. 467). However adequate or inadequate the initial grounds might have been, a large amount of research has been undertaken to explore the significance of the frontal lobes for intellectual processes.

The problems involved in demonstrating the relation of the frontal lobes to intellectual processes were more difficult than those encountered in exploring the significance of the sensory and motor areas of the cortex. In the latter case, electrical stimulation of the tissue had a definite effect, although, as recent research has demonstrated, the relevance of these effects for the function of the central nervous system is not yet clear. However, with the exception of the somatic motor area, stimulation of the frontal lobes had no effect and the neurophysiologist had to vary systematically both his cortical procedures and his behavioral measures. As a consequence research on this problem has been controversial from the start.

The earliest studies on animal behavior involving surgical removal of frontal lobe tissues were done without clear-cut anatomical or behavioral criteria for evaluation of the results. Bianchi's (1895) work on monkeys and dogs is typical. The location and amount of tissue to be removed was essentially uncontrolled, varying from animal to animal. It was therefore difficult to compare the results from different operations. The only data on the effects of the surgical procedures were in the form of anecodotal reports of changes in behavior or "psychical condition" manifested in the laboratory setting. Again it was impossible to compare the results from subject to subject. Bianchi, working with these limitations, concluded that operations on the frontal lobes did influence the intellectual functions of his animals. Others working at the same time with similar limitations arrived at the opposite conclusion (cf. Horsley & Schäfer, 1888).

Beginning about 1900, Franz (1907) began a series of studies on monkeys and cats designed to specify more precisely the cortical lesions produced and to measure the effects of the operations on specific habits. He trained the animals to open puzzle boxes; then, after systematically varying the amount and location of cortical tissue removed for different animals, he tested them again on the original problems. Although the results were not wholly consistent, Franz felt that his data warranted the conclusion that destruction of tissue in the frontal lobes results in the loss of the newly formed habits which, however, could be relearned. Well established habits were not affected by the operations.

Subsequent studies have varied both the lesions and the kinds of tasks required of the animal. Lashley's (1929) work on the performance of rats in mazes cited above led him to favor a quantitative hypothesis: the amount of tissue removed is relevant, but not its location. Jacobsen's (1931)

studies on the performance of monkeys on a variety of tasks led him to conclude that lesions in the frontal and prefrontal areas had no effect on either retention or learning of simple problem-box or pattern discrimination habits. Some impairment was noted in the retention of a more complex combination-box habit, but this effect was also noted in parietal lesions so it could not be attributed to the frontal lobes themselves. In a later study Jacobsen (1935) found that bilateral removal of the frontal lobes affected the performance of monkeys on tests which required temporal sequences of movements or delayed reactions. The interpretation of Jacobsen's later work and of the volume of research since that date is still a subject for controversy (cf. Fulton, 1951, pp. 92-94). It does seem to be justifiable, however, to offer the tentative conclusion that, if the frontal lobes are significant for intellectual processes in animals, they are necessary only for complex behavior patterns.

The data on the effects of tissue removal from the human frontal lobes are, of course, far less systematic and carefully controlled than the data from animal studies. The evidence available comes primarily from observations of the results of surgical operations conducted for two different kinds of reasons. (1) Tissue from the frontal lobes has been removed because of the presence of tumors or traumatic injuries in those areas. (2) Surgical intervention in the form of tissue removal or the section of nerve fibers has been performed for psychiatric purposes. A discussion of the rationale underlying the use of surgical procedures for psychiatric purposes will be deferred until the consideration of emotional processes in the next section.

(1) Many of the clinical reports describing the effects of frontal lobe operations performed to remove tumors are poorly documented. Cases reporting gross defects of behavior

alternate in the literature with those which fail to record any behavioral changes. The clinical value of the operation for the particular patient usually has determined the kinds of observations that were made, and few, if any, kinds of controls or systematic comparisons have been used to evaluate the conclusions. (Cf. Franz, 1907, pp. 16-24; Hebb, 1945; Sholl, 1956, pp. 73-76.) Even more carefully designed studies could not be accepted without reservation. Rylander (1939a, 1939b) used a comprehensive battery of tests in his study; besides intelligence tests, he had techniques designed to measure, among other things, attention, memory, the ability to abstract common characteristics from a set of objects, and the formation and use of abstract ideas. For each patient a "normal" control subject was chosen of the same age, sex, education, occupation, and social background. Rylander found changes in test performance for twenty-one of his thirty-two patients. On the basis of his data he concluded that the surgical removal of tissue from the frontal lobes causes intellectual deficit. A re-evaluation of the studies of Rylander and others by Hebb (1945) makes it impossible to accept this conclusion.

Hebb (1945) prepared a critical view of neurosurgical reports on the functions of the frontal lobes as a result of his observations on a patient who had had both frontal lobes removed. The operation was done to correct epileptic attacks attributed to a skull fracture some ten years before which as it turned out had destroyed both frontal poles. Before the operation the man was childish, violent, stubborn, and destructive; afterwards it was impossible to demonstrate psychological defects. All of the effects of the removal of a large portion of his frontal lobes seemed to be positive. Intelligence test scores indicated that his IQ had changed from 70 to 96, this last index well within the normal range. Social ad-

justment and intellectual performance after the operation were such that, in spite of careful medical and psychiatric screening, the patient was accepted by the army and spent ten months overseas before an epileptic attack, apparently brought on by hard labor, resulted in his discharge. Hebb was disturbed by the absence of gross defect in this patient in contrast to the reports from other cases which involved similar operations, so he made a careful analysis of such studies.

Pared to its essentials, Hebb's critique may be stated simply. Previous studies reporting extreme behavioral deficit had drawn their conclusions on the basis of a common logical paradigm. They had removed tissue from the frontal lobes *and* changes in behavior had been observed; therefore, they argued that the tissue removal had caused the changes in behavior. This logical device of *post hoc ergo propter hoc* is fallacious, and Hebb hastened to point it out. Simple succession in time is not sufficient to establish causal relations. A more detailed description of the operation and the context in which it was performed will clarify the problems Hebb found in interpreting previous results: (a) Prior to the operation the patient was hospitalized for some neurological disorder which may have had a history of many years duration. (b) Immediately before the operation the patient's behavior was observed and studies were made of his performance on certain tests. (c) During the operation, incisions were made in the brain, and certain amounts of tissue were removed. (d) After the operation, the patient's behavior was observed, and studies were made of his performance on certain tests. It seemed to Hebb that for each of these four conditions influences were present which made it impossible to attribute changes in behavior solely to tissue removal.

(a) The previous history of the patient must be considered.

The length of his illness and the degree to which it has affected his normal activities, his job, and his financial status are relevant variables. The effect of the illness on his family and their attitude toward him and his operation may be pertinent. Finally, the patient's conception of his illness and of the possible consequences of the operation also enter in. The neurological disorder is not the only factor influencing his behavior prior to the operation.

(b) Observations of behavior and tests of performance for one subject must be interpreted cautiously. No measure of intellectual functioning is perfectly reliable; judgments of test reliability can only be made for groups of subjects. In addition, the conditions listed under (a) certainly make it difficult to conclude that the pre-operative performance reflects the typical behavior of the patient.

(c) The operation itself also provides sources of variability other than tissue removal. It is difficult to determine whether all the defective tissue has been excised. Even where that seems to have been accomplished, scarring and subsequent atrophic changes might occur. Tumor growths have been found to cause pathological changes at some distance from their locus because of compression. In addition, it is necessary to realize the possible effects of the operation on blood supply, chemical changes in the cells, and the like.

(d) The interpretation of the changes in behavior and test performance after the operation are subject to the same qualifications noted under (b). Variability in performance by a subject on successive testings is expected; this variability can only be evaluated if the patient population is sufficiently large for statistical tests of significance. After the operation the patient is aware that certain portions of his brain have been removed and his conception of their significance will undoubtedly influence his behavior. Moreover, his status as

a patient has changed, both for himself and for his family, e.g., whether he would be able to return to his normal activities after discharge from the hospital.

The factors described under these four headings make it apparent that an intellectual deficit, if present, can not be attributed solely to surgical removal of tissues from the frontal lobes as Rylander had claimed. No matter how carefully the tests have been selected or how comprehensively they sample the relevant behaviors, any changes in test performance reflect changes in the patient's total situation. Although the use of a control group is certainly pertinent for studies of this kind, it is at present impossible to know what factors need to be controlled. Age and amount of education can be equated, but hospitalization for a year and failure to earn an income for that period of time may also need to be considered. Other studies could be cited in elaboration or extension of these considerations, but Hebb's conclusions seem unavoidable: "no one has as yet shown that defects follow a simple loss of tissue from man's frontal lobes." He does go on to say, "the loss must, presumably, have some effect, but it is hard to demonstrate and its nature is not yet clear" (Hebb, 1945, p. 24).

(2) Systematic studies of operations made on the frontal lobes for the therapeutic treatment of psychiatric patients support Hebb's conclusions about our knowledge of the role played by the frontal lobes in intellectual functions. For the present purposes it will be sufficient to describe briefly the results of two of the most carefully controlled studies: the Columbia-Greystone Project (Mettler, 1949) and the Second Lobotomy Project of the Boston Psychopathic Hospital (Greenblatt & Solomon, 1953).

The Columbia-Greystone Project (Mettler, 1949) was designed to permit a systematic evaluation—medical, psycho-

logical, psychiatric—of the results of bilateral symmetrical removals of tissue in different anatomical areas of the frontal lobes. None of the patients showed any permanent impairment of function from the operation which could be demonstrated on an extensive battery of psychological tests. No loss in memory, learning, or intellectual functions could be attributed to the operations; instead, gains in recall and recognition scores were often observed. Impairment of the ability to abstract or generalize could not be regularly demonstrated. No permanent changes were noted in intelligence test scores; transient losses were usually regained within four months. The overall evaluation of the Columbia-Greystone Associates is that the frontal lobes do not seem to play an important role in intellectual functioning of the kind required for the tests they used.

The lobotomy operation performed in the Boston Psychopathic Hospital studies (Greenblatt & Solomon, 1953) does not involve removal of tissue from the frontal lobes. Instead, small holes are bored in the top or side of the head and a knife used to sever the fibers which connect the frontal lobes with other areas of the brain. Assessment of changes following the operation showed, if anything, improvement in intellectual functioning. Ability to think conceptually or abstractly and make inferences improved; thinking seemed more controlled and coherent. The changes certainly must be understood in relation to low test scores before the operation and to the psychiatric status of the patients which may have influenced those scores. However the improvements might be explained, it is clear that the operation did not reduce intellectual functioning in any way that the methods of assessment used in this study could identify.

The conclusions reached by Hebb and the staff of the two projects cited leaves the role of the frontal lobes in intellec-

tual processes highly uncertain. More work is being done; some investigators have studied the effects of frontal lobe lesions in relation to other ways of measuring intelligence, biological intelligence for example (cf. Halstead, 1947), but most neurophysiologists are concerned with exploring the neurophysiology of intellectual processes in different kinds of ways. A quotation from Lashley seems appropriate at this point. He says: "In fantasy, I have thought perhaps that my most important contribution when I reach retirement age would be to have my frontal lobes removed and see what I could do without them. I have less confidence than Dr. Halstead that it would preclude the production of something of interest" (Jeffress, 1951, p. 145).

Emotional Processes

In 1900 the neurophysiologist's knowledge about emotional processes in relation to the functions of the cerebral cortex was in some ways comparable to his knowledge of the cortical components of the intellectual processes. Electrical stimulation of the cortex had failed to elicit emotional responses just as it had failed to produce responses which could be identified as intellectual. So studies of emotional processes also began by removing various parts of the association areas and observing behavior subsequent to the operation. However, the emotions in contrast to the "higher intellectual operations" were never considered distinctively human; if anything, they were a part of man's animal nature and, as such, the cortical regions which developed latest phylogenetically were not necessarily involved.

Neurophysiologists studying emotions following Fritsch & Hitzig's discovery had less grounds for attributing a central role to the cortex than did those who were interested in intellectual processes. Experiments had been completed by

1886 so that Ferrier could report that "animals deprived of their cerebral hemispheres are still capable of exhibiting, in response to various forms of sensory stimulation special and general, reactions, more or less complex, which do not at all differ in character from those which we associate with feeling or emotion" (Ferrier, 1886, p. 146). He felt the evidence was sufficient to justify concluding that "the centres of emotional expression are therefore situated below the centres of conscious activity and ideation" (p. 147) which he considered to be located in the cerebral cortex. Ferrier did not specify clearly how he thought cortical mechanisms might be related to emotional expression. However, since emotions did affect states of consciousness, which for Ferrier were cortically determined, he felt that the activity of the centers of emotional expression must be represented in some form in the cortex.

Sherrington (1906) was more specific about his conception of the relations between the cerebral cortex and emotional processes. His studies of animals whose cerebral hemispheres had been removed led him to consider their emotional behavior as "pseudaffective," "mimetic movements simulating expression of certain affective states" (p. 251), but actually quite different from such states in the normal animal. In contrast to James and Lange who believed that emotions were reactions to visceral stimulation, Sherrington, representing the dominant tradition in neurophysiology at that time, argued that, although subcortical mechanisms were definitely involved, the initiation and maintenance of real (not "pseudaffective") emotional reactions were determined primarily by the cerebral hemispheres.

The identification of the frontal lobes as the areas of the cortex related to the emotions was suggested in early research by Bianchi (1895) and others, but the conception of the relationship was not clearly stated at that time. Bianchi

reported that for his monkeys "friendliness and sociability (are) impaired; . . . their avidity becomes reckless and insatiable," and he spoke of "a dissolution of the psychical personality" (1895,p. 522). His results contrasted with the negative findings of Horsley & Schäfer (1888) just as they had for observations of intellectual processes. Franz (1907) in his more carefully controlled studies stated that "the emotional condition of the animal remains the same after as before the removal of the frontals" (p. 63). However, although Franz had systematic ways of evaluating the effects of the operations on habits, his judgments of emotional change were as anecdotal as those of his predecessors.

Much of the subsequent neurophysiological research on emotions is associated with the work of Cannon (1929) and Bard (1928, 1934a, 1934b, 1950). They began by studying more carefully the effects on animal behavior resulting from removal or isolation of the cerebral hemispheres. They observed in their animals a complex rage reaction elicited by trifling disturbances and distinctive for its intensity and breadth of expression. This "sham rage" was quite different from the "pseudaffective" reactions noted by Sherrington which were more similar to a normal animal's expressions of mild anger. Further research led them to identify the hypothalamus, one of the subcortical regions of the central nervous system, as the mechanism involved in the production of sham rage. Destruction of tissue which left the hypothalamus intact resulted in sham rage; direct stimulation of the hypothalamus produced the rage reaction; destruction of the hypothalamus eliminated it. Once the functions of the subcortical center for emotional expression were identified it became necessary to determine the way in which the cerebral cortex itself was involved in the process.

The studies of the hypothalamus suggested that the cortex

acted as an inhibiting agent in emotional behavior. Since the hypothalamus was directly connected by nerve fibers with regions in the frontal lobes, subsequent research on emotional processes focused on the same cortical areas that had been involved in research on intellectual processes. Some experiments had reported that removal of certain portions of the frontal lobes did result in hyperexcitability for some animals. Bard's (1950) work on cats involving total removal of the frontal lobes failed to reveal changes in their emotional behavior. However, removal of most of the cortex except for certain portions of the frontal lobes resulted in an exaggerated placidity. When these frontal areas were removed in the placid animals, they displayed the characteristic sham rage reactions. Bard concluded that the frontal regions of the cat's brain "contribute equal excitatory and inhibitory effects" (1950, p. 217) in their influence on rage reactions. The particular manner in which these effects are accomplished is still being studied.

The significance of the research conducted by Cannon & Bard for understanding the function of the human frontal lobes is not clear. The stereotyped rage reactions characteristic of cats do not generalize readily to human behavior. Research on the effects of frontal lobe removal in primates seemed to contradict the findings of Cannon & Bard. Jacobsen (1931, 1935) reported that "no permanent emotional changes were found" (1931, p. 339) in his studies of monkeys which have already been discussed in connection with intellectual processes. His data did not permit him to decide whether the frontal lobes might have an inhibitory effect or whether some change in distractibility could be said to result from the operations. However, some of Jacobsen's monkeys did show a reduction in temper tantrums and anxiety behavior under frustrating conditions. When these results

were reported at the Second International Neurological Congress in 1935 (Fulton & Jacobsen, 1935), they made a significant impression on Egas Moniz, a Portugese neurosurgeon, who felt that such an operation might be helpful for psychiatric patients. As a result Moniz (1936) developed the frontal lobotomy, a surgical procedure which involved severing the nerve fibers connecting the frontal lobes with the hypothalamus and other subcortical centers (cf. Fulton, 1951, pp. 98-100; Freeman & Watts, 1950, pp. xvi-xvii).

The theoretical considerations which Moniz advanced to justify this operation have been described as follows: "In the course of daily life . . . the human individual responds to various external happenings but in a very flexible manner. Certain happenings, however, serve to elicit responses that tend to become stereotyped, conditioned and thus indicate a certain stabilization of synaptic patterns in the nervous system. The stereotyped patterns of behavior on the part of mental patients seem to result from such stabilization, and shock methods are designed to break them up by forcible disruption of the synaptic connections. Prefrontal lobotomy has the same effect. By disrupting the stabilized synaptic patterns it abolishes the abnormal conditioned responses and restores the patient to a more flexible type of behavior" (Freeman & Watts, 1950, pp. 540-541).

Since 1935 when frontal lobotomies were first systematically performed for psychiatric purposes, tens of thousands of patients have been treated by that procedure or by variations which involved removing different amounts of frontal tissue from different locations (cf., e.g., Mettler, 1949; Freeman & Watts, 1950; Fulton, 1951; Greenblatt & Solomon, 1953). Moniz (1936) reported that an impressive number of his patients showed dramatic emotional changes: elimination of depression, relief from anxiety. With the increased use of

lobotomy the results reported became more varied. Some patients were helped; for others serious disturbances followed the operation; for others no noticeable differences in behavior could be detected. At the present neurophysiologists, neurosurgeons, psychiatrists, and psychologists are by no means agreed about the appropriateness of the operation or the significance of its effects.

Freeman & Watts (1950) were among the first to perform frontal lobotomies in this country. Summarizing the results from studies of patients on whom they had operated over a thirteen year period, Freeman & Watts reported that about 45 per cent have shown good improvement, 33 per cent only fair, while 19 per cent did poorly. On the basis of their results they believe that the frontal lobes are concerned with the future, providing "foresight and insight" for the normal person. When the frontal lobes are damaged as in lobotomy, inertia, loss of self-consciousness, and lack of ambition result, and the patient's behavior may be characterized by euphoria, aggressiveness, and poor judgment. Freeman & Watts are convinced of the efficacy of the operation in psychiatric cases and believe that their results provide evidence about the functions of the frontal lobes in emotional processes.

Other studies of the effects of surgical procedures for psychiatric patients have been less confident about the value of the operation and its relevance for understanding the frontal lobes. Carney Landis, reporting for the Columbia-Greystone Project cited earlier, stated that "there is no clear-cut evidence of a consistent or uniform personality change which resulted from any particular variety of topectomy (removal of tissue from certain parts of the frontal lobes) in which the operation could clearly be said to be solely responsible for the change. The amelioration from psychosis and social improvement which occurred in many of the operatees is easiest

understood as an indirect effect of the operation. If any operation specifically changed behavior some clear-cut regular phenomena should have been evoked. If any variety of operation had specifically resulted in the alleviation of some physical or mental disease or in the change of a particular personality structure, then greater regularity of results should have been achieved. It is an old clinical observation that any of a wide variety of physical injuries may be followed by a temporary amelioration of psychotic symptoms. Mentally disturbed patients are frequently relatively lucid during convalescence from an appendectomy, while recovering from a broken leg, or following an acute bout with an infectious disease. It is conceivable that the mental amelioration following topectomy might be basically the same sort of thing" (Mettler, 1949, pp. 494-5). In brief, as Landis went on to say, "No existing theory or hypothesis dealing with the psychologic significance of the human frontal lobes is tenable" (Mettler, 1949, p. 496).

Neurophysiologists in 1900 were less clear about their conception of the cortical mechanisms involved in emotional processes than they were about those related to sensory-motor and intellectual functions. As the studies cited in this section illustrate, it is not possible at this time either for neurophysiologists to specify unequivocally the function of the frontal lobes in emotional processes. Hypotheses have been advanced, but the data gathered to document them has not been sufficient to secure a consensus. Part of the difficulty in studies of emotional processes in contrast to those concerned with sensory-motor or intellectual activities can be attributed to the relative lack of clarity in specifications of emotional behavior. The use of lobotomies and lobectomies for psychiatric treatment represents a significant affirmation on the part of some neurosurgeons and psychiatrists of the

adequacy of our knowledge of the central nervous system and its relations to behavior. They believe that some types of disturbance in a patient's life are serious enough to justify a radical procedure in spite of the inadequacy of our knowledge and because such operations might add to that knowledge. Others believe that until we understand more about the neurophysiological functions of the cortex such operations should not be performed. Further research will in time provide data which should allow this issue to be decided, providing that more adequate criteria for specifying emotional behavior are developed.

Discussion

In the preceding three sections selected studies have been examined which illustrate contemporary knowledge about the relations between certain parts of the cerebral cortex and somatic sensory and motor processes, intellectual processes, and emotional processes. While neurophysiologists in 1900 were confident about the adequacy of their understanding of the ways in which the brain functioned to mediate between the environment and behavior, neurophysiologists of the present are far from certain. Penfield & Rasmussen (1950), discussing the neurosurgeon's interest in the functions of the central nervous system, noted that "he must endeavor to determine what areas may be removed from the cerebral cortex without producing functional defects. His goal is achieved if he learns nothing at all positive about function! He thus discovers that removal of certain areas produces no defect that he or the patient recognizes. . . . The surprising fact is that so large a proportion of the human cerebral cortex may be called *dispensable cortex*" (p. 201).

Contemporary neurophysiologists, while uncertain, are far from inactive. Extensive research studies are being con-

ducted, some along the lines of the research described above in attempts to specify more precisely those neurological variables, others exploring new kinds of variables, biochemical and electrical as well as physiological. Eccles, commenting on a paper which reviewed the "Early development of ideas relating the mind with the brain" (Magoun, 1958), remarked as follows: "Prof. Magoun has been very subtle in presenting us with his paper, because it shows how intimately our thinking is dependent upon what is known anatomically. It is a warning for us. Here we have seen the attempt to fit function to the crude anatomy which was all these physiologists had in those days; and they could only fit crude functional interpretations. Do we still err so remarkably? In some hundreds of years' time, will our present concepts look so archaic, simply because we are still fitting them to the only anatomy we have, which is what the anatomists give us? In the nervous system, we physiologists are more dependent upon what the anatomists tell us than we are anywhere else. Have we finally reached some of the basic levels of anatomy upon which we can securely build, e.g., the neurone, the synapse and all the more detailed material which is now coming with electron microscopy? Is this in turn to be superseded, and are we to look archaic? It is a very sobering thought" (Wolstenholme & O'Connor, 1958, p. 24).

Lashley's comments on the relations between brain and behavior viewed in the context of phylogenetic studies are also pertinent: "When comparing the brains and the behavior of animals at different levels in the phylogenetic scale, I have been much puzzled by the lack of significant correspondences. The brains of insect, cephalopod, bird, and mammal are as unlike in gross structure and arrangement as one can well imagine. Yet these animals show essentially the same fundamental types of behavior. They all learn, and

with simple tasks and optimal conditions at about the same rate. They show the same types of perceptual generalization, the differentiation of figure from ground, the recognition of similarities among objects. All show similar perception of spatial relations. There are even suggestions of insight, or a primitive grasp of logical relations, by animals as primitive as the arthropods. The differences are quantitative rather than qualitative.

"It looks as though these basic mechanisms of behavior are somehow inherent in the structure of the nerve net, in the primitive organization of nerve cells, and are largely independent of the gross structures which have been evolved in phylogenetic history. Evolution of the nervous system seems to have been largely a matter of meeting the demands of the moment and of irreversibility of what has once been started. The primitive mammal was almost certainly nocturnal, making little use of vision. The cerebral hemispheres consequently developed as an outgrowth of the then dominant olfactory brain. Had the creature been diurnal, its intellectual development might have centered on the midbrain with enlargement of the optic lobes, but with no great difference in the final intellectual achievement.

"My point is that, although the detailed tracing of the structural changes of the brain in evolution is important for understanding of the evolution of the brain, the gross structural changes may be almost completely irrelevant to the problem of the evolution of behavioral or mental traits" (Association for Research in Nervous and Mental Disease, 1954, p. 95).

The statements of Eccles and Lashley present a broader perspective within which to view the research described in the previous sections of this paper. Considering that psychology is interested in data which would aid in the develop-

ment of ways of explaining and predicting behavior, it might seem at first that current neurophysiological findings are of little value. Certainly, the neurophysiologists of 1900 provided a clear, simple, mechanical model which early psychologists could and did use to develop their theories. Contemporary neurophysiology does not provide such a model, but, by revealing the complexity and flexibility of man's structural characteristics, it forces psychology to develop richer and more refined ways of specifying both behavior and the conditions under which it occurs. Such a specification will be necessary for the development of neurophysiology itself, for as Harlow (1958) has pointed out and the material in this paper can illustrate: "no interdisciplinary research (in this area) can be better than the behavioral measures which provide its dependent variable or variables" (p. 5).

To the extent that Harlow's statement is relevant, it would seem that the differences in the results of research on sensory-motor, intellectual, and emotional processes noted in the preceding sections of this paper might be related to differences in the adequacy with which the behaviors involved for each can be specified. Observations of sensory and motor processes can be made both objective and measurable. Studies of intellectual processes are less objective, but it is still possible to specify criteria for their measurement. Judgments about emotional processes are neither objective nor measurable. To the writer it would thus appear that, following Harlow, the future of research on the relations between the brain and behavior would depend more on the adequacy with which we can refine our techniques for measuring behavioral variables and less on developments in neurophysiology, neuroanatomy, or biochemistry. Thus, although research in neurophysiology since 1900 has not resulted in a model for explaining and predicting human behavior, it has

freed psychology from the necessity for working with simple, mechanical conceptions. At the same time, the responsibility of the psychologists for providing clearer and more rigorous specifications of behavior has increased. Both of these consequences should be beneficial to the development of psychology.

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